

MANAGING WORK GROUP SOCIAL CAPITAL TO PROMOTE  
ADAPTABILITY AND INNOVATIVENESS

A Dissertation

Presented to the Faculty of the Graduate School  
of Cornell University

In Partial Fulfillment of the Requirements for the Degree of  
Doctor of Philosophy

by

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May 2010

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# MANAGING WORK GROUP SOCIAL CAPITAL TO PROMOTE ADAPTABILITY AND INNOVATIVENESS

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Cornell University 2010

This study examines the role of social capital-enhancing human resource (HR) practices in creating the context for innovativeness and adaptability in work groups. Specifically, I present a theoretical model in which social capital-enhancing HR practices foster group innovativeness and adaptability by promoting the development of group climates and external ties which provide groups with the access to knowledge and tangible resources necessary to innovate and adapt. I then present an empirical test of this model based on data collected from employees and managers in 68 work groups in the science and engineering division of a large hydroelectric power organization. Implications for research and practice are discussed.

## BIOGRAPHICAL SKETCH

Rebecca Kehoe is a doctoral candidate in Industrial and Labor Relations. Prior to her doctorate, Rebecca completed a Bachelors degree at Cornell University with a double major in Communication and Applied Economics and Management and a Master's of Science in Industrial and Labor Relations. Rebecca's research interests are in the areas of strategic human resource management, social capital, knowledge management, and innovation.

This dissertation is dedicated to my husband, Ryan Kehoe.

## ACKNOWLEDGMENTS

I am grateful to several faculty, friends, and family for their significant contributions to my academic endeavors and to the completion of this dissertation. Their ongoing emotional and intellectual support has played an important role in my graduate school experience.

I would first like to thank my advisor and dissertation chair, Chris Collins. Over the last five years, Chris has continually helped me to find the critical pieces that I was missing at different points along the way: from an academic voice to a research setting for my dissertation to confidence in my work, among many other things.

I would also like to thank the other members of my dissertation committee, Olga Khessina, Pat Wright, and Tom DiCiccio, for their valuable feedback and insight both in the writing of this dissertation and in the framing this research for presentation on the job market and for publication.

Over the years I have presented research on several occasions in the HR department's weekly workshop. I want to thank the faculty and students in this department for their many contributions throughout these presentations as well as in one-on-one conversations at other times. These insights have been instrumental in shaping my work at each stage of the research process.

I am also extremely grateful to the family and friends who have supported me through the ups and downs of the last five years. Phone calls, visits, and walks for coffee kept me smiling through the better part of this journey.

Most importantly, I want to thank my husband, Ryan Kehoe, for the constant love, patience, and support he has always shown me in everything I do. For all of this I dedicate this dissertation to him.

## TABLE OF CONTENTS

Biographical Sketch	iii
Dedication	iv
Acknowledgments	v
List of Figures	vii
List of Tables	viii
Introduction	1
Theory and Hypotheses	8
Method	46
Analyses and Results	54
Discussion	68
Appendix	83
References	87

## LIST OF FIGURES

Figure 1. Predicted Model of Group Adaptability and Innovativeness	9
Figure 2. Interaction between Access to Group Knowledge and Tangible Resources Predicting Adaptability	69
Figure 3. Interaction between Access to Group Knowledge and Tangible Resources Predicting Innovativeness	78



## LIST OF TABLES

Table 1. Correlations, Means, and Standard Deviations	55
Table 2. Results of Regression Analyses Predicting Social Climate	58
Table 3. Results of Regression Analyses Predicting Tie Number, Range	59
Table 4. Results of Regression Analyses Predicting Access to Knowledge	60
Table 5. Results of Regression Analyses Predicting Access to Tangible Resources	62
Table 6. Results of Regression Analyses Predicting Adaptability	63
Table 7. Results of Regression Analyses Predicting Innovativeness	65

## INTRODUCTION

It is widely recognized among organizational scholars and practitioners that effective and continuous organizational renewal is increasingly required for firms' survival and success in today's competitive environment (Danneels, 2002; Helfat et al., 2007). Continuous change and uncertainty spanning technological, cultural, financial, and political arenas have forced organizations to constantly predict, sense, analyze, react to, and adapt to environmental turbulence and shifts at unprecedented rates merely to ensure survival (Kozlowski, Watola, Nowakowski, Kim, & Botero, 2009). Success and competitive advantage require not only sufficient alignment of an organization with its environment but also the innovation and renewal of ideas, processes, and capabilities to even temporarily position a firm ahead of its competition and at the frontiers of change (D'Aveni & Gunther, 1994).

A growing body of literature has begun to explore factors that can improve the outcomes of organizations' renewal efforts, with research in this area tending to focus either on a) the identification of relevant managerial capabilities and behaviors for developing and enacting organizations' renewal strategies (e.g., Brown & Eisenhardt, 1997; Kor & Mahoney, 2005; Rindova & Kotha, 2001) or b) effective management of the individuals in an organization's core workforce for successful innovation-oriented performance outcomes at the organizational level (e.g., Collins & Smith, 2006; Smith, Collins, & Clark, 2005; Subramaniam & Youndt, 2005). The former line of work, while valuable from a purely strategic standpoint, has tended to devote little or no consideration to the active roles that an organization's non-managerial core workforce can play in renewal efforts, nor to the ways in which these employees' contributions to renewal can best be supported. Thus, this stream of research leaves the potential of the vast majority of organizations' human resources largely untapped in the renewal process. On the other hand, the latter line of research not only accounts for but seeks

to maximize core employees' potential to contribute to organizations' renewal efforts. However, research in this vein has tended to ignore an important aspect of the structural context of today's organizations: the increasing use and importance of groups in the completion of work.

In fact, over the last two decades, organizations have increasingly shifted to structuring work around groups rather than individuals, recognizing the power of groups to combine diverse sets of skills and experiences in completing tasks (Salas, Sims, & Burke, 2005); span geographical, cultural, and organizational boundaries; and, in many cases, plan and execute appropriate and adaptive responses to environmental pressures more effectively than individuals (Burke, Stagl, Salas, Pierce, & Kendall, 2006; Kozlowski & Bell, 2003). Additionally, the use of groups enables organizations to more adeptly manage operations in numerous environmental spaces simultaneously by providing organizations with multiple faces for multidirectional exchange, adaptation, and growth. This shift in the direction of group-based work is likely to have at least two important implications for organizations' renewal efforts. First, it is likely to be possible and even preferable for managers to delegate several renewal-oriented tasks (e.g., sensing, innovating, adapting) to work groups, whose members are likely to collectively possess broader capabilities, a more useful set of personal ties, and a larger interface with the organizational environment than most individuals (Salas, et al., 2005). Second, it is likely to be useful for organizations (and scholars) interested in renewal to conceptualize renewal-oriented management of employees at the work group level, as this is the level and location in an organization at which a) a single manager or supervisor is likely to be responsible for managing a group of employees (and thus for the implementation of a particular management approach or set of management practices) (Wright, Gardner, Moynihan, & Park, 2001); b) key group dynamics are likely to emerge; and c) complex group processes

(which have the potential to provide groups advantages over individuals) are likely to occur (Schneider & Reichers, 1983). Thus, by examining the facilitation of renewal-oriented capabilities at the work group level, it may be possible to better understand the ‘meso-foundations’ of organizational renewal in firms and thus to more precisely identify the specific components of a management approach likely to best support the work group characteristics most conducive to organizations’ renewal efforts.

The present paper focuses on the role of human resource management practices in the facilitation of two work group capabilities which are likely to be essential to organizational renewal: group adaptability and innovativeness. Specifically, adaptability reflects a group’s capacity to effectively and efficiently respond to changes in the environment (Pulakos, Arad, Donovan, & Plamondon, 2000), and innovativeness represents a group’s willingness and ability to push new frontiers in adopting, creating, and implementing original, creative ideas (Calantone, Cavusgil, & Zhao, 2002). Thus, these two work group capabilities are likely to critically impact organizational efforts to remain adequately aligned with the current state of the environment and to build and expand new organizational competencies over time, respectively – two key requirements for achieving continuous renewal of the organization (Danneels, 2002; Kozlowski et al., 2009).

Consistent with recent recommendations in the strategic human resource management (SHRM) literature (e.g., Becker & Huselid, 2006; Kehoe & Collins, 2008), I work backward from these outcomes of interest in identifying an appropriate system of human resource management practices which is most likely to aid in their facilitation – reflecting a departure from the prevalent approach in much of the existing SHRM research, which has been to present and test predictions of the superiority of a commitment- or performance-oriented HR system across organizational outcomes and contexts. Thus, in the following paragraphs I begin by

proposing two work group conditions (i.e., access to knowledge and access to tangible resources) which are likely to be critical to work groups' abilities to innovate and adapt. I then identify a set of work group characteristics which are likely to promote these favorable conditions; in particular, I argue that a supportive work group social climate and particular types of relationships held by work group members with actors external to the group are likely to provide the social capital needed to facilitate the work group's collective access to knowledge and tangible resources. Finally, from here I identify a set of HR practices which are likely to facilitate the development of these forms of social capital in work groups by promoting a positive social climate and encouraging supportive social relationships with external actors. By working backward from outcome to management system in this way, I am able to identify the core requirements of an appropriate HR approach and ensure that these requirements are each met by multiple practices in the proposed HR system.

Previous research on organizational renewal processes and outcomes has pointed to organizations' access to intangible and tangible resources as important predictors of adaptive and innovative capabilities. For example, superior access to knowledge can enable organizations to more effectively adapt by providing them with an improved sense of oncoming environmental shifts and a larger repertoire of skills with which to develop and execute responses (Eng & Quaia, 2008) and is likely to contribute to organizations' innovativeness by making available a greater base of ideas and expertise for members to collectively rework and combine in creating new knowledge, ideas, and processes (Nahapiet & Ghoshal, 1998; Smith, Collins, & Clark, 2005). The importance of tangible resource access for innovative and adaptive organizations has been noted in for its role in promoting norms of experimentation (Bourgeois, 1981, providing a buffer to allow for loss absorption (March, 1991), and encouraging a tolerance of uncertainty (Levinthal & March, 1993).

However, while research on organizational renewal has emphasized the importance of organizations' resources for the development of renewal capabilities (e.g., Helfat et al., 2007; Teece, Pisano, & Shuen, 1997), resources possessed by an organization are likely to have limited influence on capabilities such as adaptability and innovativeness at the work group level unless they are visible and accessible to work group members, as these are the actors most directly responsible for the development and use of work groups' capabilities. In fact, knowledge and resource transfer within organizational boundaries poses a substantial challenge and is by no means automatic or certain (e.g., Hansen, 1999, 2002); thus an organization's possession of abundant resources is no guarantee of superior resource access across all of its work groups. On the other hand, work groups are also not necessarily constrained by inferior resource positions of their organizations for at least two reasons. First, resource distribution within an organization does not always result in equal or even similar allocations across groups (e.g., Brown & Eisenhardt, 1995; Hansen, 1999), such that a relatively well endowed work group in a resource-poor firm may actually have superior resource access compared to a poorly endowed work group in a resource-rich firm. Second, work groups, often more so than individuals, have the potential to access resources from a variety of sources, such that resource deficiencies at the organizational level can likely be overcome by groups through social connections in other contexts (Salas et al., 2005). Thus, it is likely to be more meaningful to focus on *work groups*' – as opposed to organizations' – access to and possession of relevant tangible and intangible resources in considering the development of renewal capabilities (i.e., adaptability and innovativeness) at the work group level.

Given the location of work groups at the intersection of three environmental spaces (i.e., the area occupied by the group itself, the organization in which the group

exists, and the larger environment in which the organization operates) which include diverse sets of actors who are often involved in relationships and exchanges which cross these very spatial boundaries, work groups are often uniquely positioned to access resources from a variety of sources. However, for such resource advantages to materialize, work group members must collectively possess superior levels of social capital, embedded in relationships which provide social contexts supportive of open exchange – making the characteristics of work groups’ internal social climates as well as of their social ties with other organizational members (i.e., internal ties) and actors external to the organization (i.e., external ties) especially critical to their intangible and tangible resource positions (Oh, Chung, & Labianca, 2004). In particular, within a work group, a social climate characterized by high levels of trust and cooperation, the development of a shared language among members, and healthy levels of productive task conflict is likely to facilitate the willingness and ability of group members to share ideas, information, and constructive feedback – thus promoting the group’s collective access to the knowledge held by its individual members. External to the group, knowledge and tangible resource access is likely to be promoted by the strength, range (i.e., diversity), and number of relationships between group members and other actors – where strength in relationships is likely to enable the transfer of complex and sensitive knowledge, relationship range is likely to increase the variety of tangible and intangible resources available through tie partners, and involvement in a large number of relationships increases the number of people from whom resources can potentially be obtained.

Given the need for a supportive work group social climate and for these specific types of relationships between work group members and actors external to the group in the facilitation of the work group conditions (i.e., access to knowledge and tangible resources) necessary for adaptability and innovativeness to emerge, I propose

a system of Social Capital-Enhancing (SCE) HR practices which target these specific work group social capital requirements. In particular, this system includes practices which provide training, reimbursement, and financial incentives to promote work group members' external network development and which offer employees several opportunities and rewards for developing a climate characterized by trust, cooperation, shared language, and productive task conflict with the other members of their work group.

Having outlined the logical sequence I followed in identifying the requirements of an HR system likely to aid in the development of work groups' adaptability and innovativeness, I proceed in the remainder of the paper in a more traditional chronological fashion. In particular, in the sections that follow, I begin from a strategic human resource management perspective in exploring in greater detail the types of human resource management practices most likely to support the types of social capital in work groups' climates and social ties noted above. Next, I rely on social capital theory to draw a connection from work groups' social climates and tie characteristics to their access to knowledge and tangible resources. I then establish a theoretical relationship between knowledge and tangible resource access and adaptability and innovativeness. Finally, I provide an empirical test of this model using data collected from work groups and managers in a science and engineering firm specializing in the design and rehabilitation of infrastructure for energy generation and transport. The predicted model appears in Figure 1.

## **THEORY AND HYPOTHESES**

### **A New Approach to Strategic Human Resource Management**

As a field, strategic human resource management (SHRM) emerged from the recognition that human resources have become an increasingly important input to organizational success and that effective management of a firm's employees is likely



to lead to improvements in organizational performance. Specifically, SHRM scholars have argued that effective human resource management practices can be used to create or elicit the abilities, motivation, and opportunities necessary for employees to meet the strategic needs of their organization (Dyer, 1985; Wright, Dunford, & Snell, 2001). Consistent with this notion, a growing body of evidence has provided support for a positive relationship between performance- and commitment-oriented HR systems and firm operational and financial performance outcomes (e.g., Arthur, 1992; Batt, 2002; Huselid, 1995; MacDuffie, 1995; and see Combs, Liu, Hall, & Ketchen, 2006 for a recent meta-analysis).

However, recent work in the SHRM literature has emphasized the need for the field to move more explicitly in the direction of exploring the role of HR in strategic value generation. For example, Kehoe and Collins (2008) challenged SHRM scholars to transcend the prevalent approach of assuming the superiority of commitment- or performance-oriented HR systems and testing their effects on various employee-centered, operational, or financial outcomes. In contrast, these authors proposed that after first identifying an organization's strategic goals, researchers should seek to identify the employee and organizational characteristics necessary to achieve these goals and then to determine the necessary role of the HR system in eliciting these workforce and organizational requirements.

Becker and Huselid (2006) advocated a similar process but urged SHRM scholars to focus more specifically on strategy implementation – reflected in strategic business processes – in determining the workforce characteristics which would need to be supported by an effective HR system. In addition, Becker and Huselid (2006) argued that researchers should seek to identify the employee groups who are most likely to contribute to a firm's strategic objectives, suggesting that organizations should invest more in these employees than in others – a notion somewhat consistent

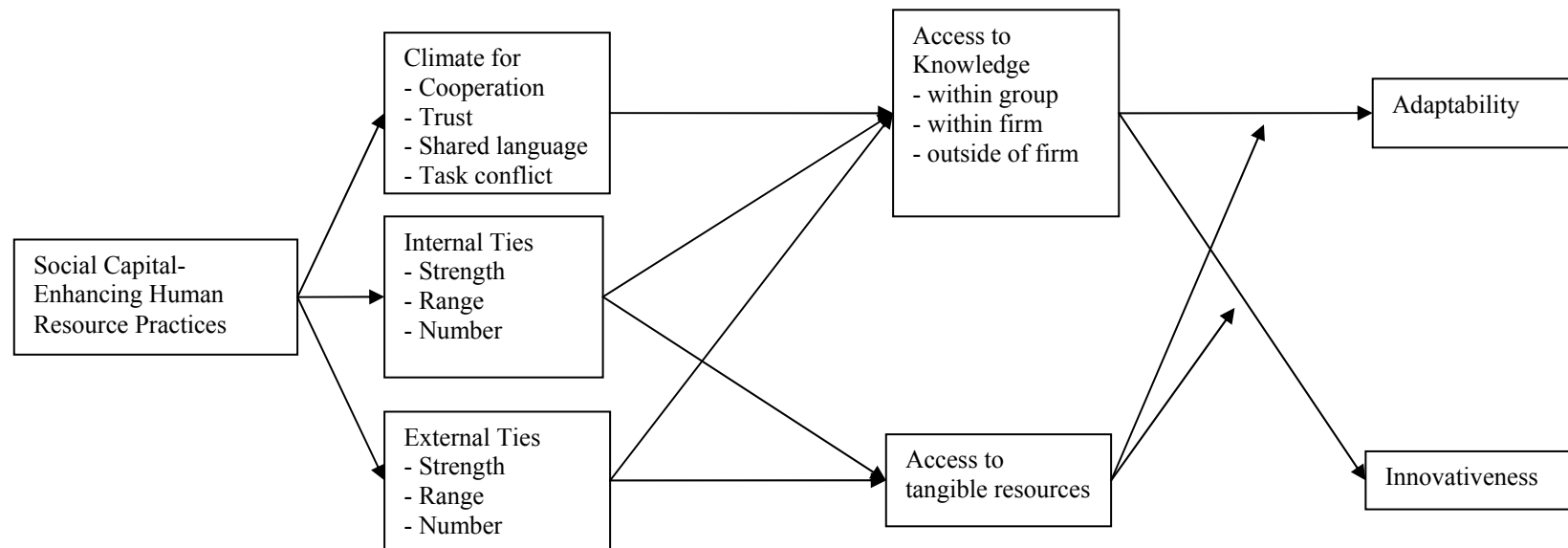


Figure 1. Predicted Model of Group Adaptability and Innovativeness

with previous arguments made by Lepak and Snell (1999, 2002) that organizations should manage different employee groups in different ways based on the relative value and uniqueness of their contributions to the organization. These arguments provide additional support for my claim that organizations should consider renewal capabilities (and their management) at the work group level. While in the present paper I take no stance on the relative investments organizations should make in various work groups, I acknowledge that an HR approach aimed ultimately at facilitating group adaptability and innovativeness may be more appropriate for use with work groups in certain contexts than in others. Specifically, group adaptability and innovativeness represent capabilities required for the strategic business process of organizational renewal; thus, an HR approach developed with end goals of adaptability and innovativeness in mind is likely to elicit larger returns when used with groups whose work positions them to make greater contributions to an organization's renewal efforts.

### **Social Capital-Enhancing HR Practices and Work Groups' Climates and Ties**

A popular theoretical framework used to provide support for HR systems in SHRM research is the AMO – or abilities, motivation, and opportunity – framework, which suggests that the effectiveness of a management system in driving employees' performance will depend on the extent to which it elicits the required abilities, provides the appropriate incentives, and promotes the necessary opportunities for employees to perform desired behaviors (Appelbaum, Bailey, Berg, & Kalleberg, 2000). While the AMO framework has typically been used to provide support for the effectiveness of high performance work systems, the approach can just as aptly be applied in theoretically verifying the effectiveness of other management approaches intended to elicit different sets of employee outcomes. Thus, in the present context, I rely on this framework to ensure that the components of the social capital-enhancing

(SCE) HR system I identify collectively provide work groups with the abilities, motivation, and opportunities to develop and maintain internal social climates characterized by high levels of trust, cooperation, shared language, and productive task conflict and internal and external network ties (i.e., relationships with actors external to the group – within and outside the organization, respectively) conducive to obtaining access to knowledge and tangible resources. The complete list of SCE HR practices used in this study appears in Appendix A.

***SCE HR practices and work group climate.*** The social climate of an organizational context is characterized by employees' shared perceptions about the ways they conduct their work and interact with others in performing their jobs and includes collective work-related attitudes, norms, values, and beliefs (Ashkanasy, Wilderom, & Peterson, 2000; Collins & Smith, 2006). While organizational scholars have studied climates at various organizational levels, a focus on climate at the work group level is likely to be particularly meaningful and valuable for at least two reasons. First, climates emerge from the shared social interactions and experiences among individuals in a collective (Schneider, 1975). Because employees in the same work group are likely to share more work experiences and interactions with one another than are employees across different work groups, shared interpretations and meaning are likely to more readily and consistently emerge within work group boundaries than across an entire organization or unit (Anderson & West, 1998; Schneider & Reichers, 1983). Second, the shared meanings and interpretations that emerge to define a climate are likely to promote consistent sets of behaviors among individuals in a collective (Schneider, 1975); thus, to the extent that desired employee behaviors vary across work groups, it is meaningful to examine and promote different climates at the work group level accordingly.

Given the examination in this paper of two consistent capabilities (i.e.,

innovativeness and adaptability) across work groups in an organization, I build on the former benefit noted above of focusing on climates at the work group level. In particular, I posit that HR practices implemented at the work group level can be used to increase the number and impact the nature of social interactions among a work group's members, thus guiding the emergence of shared contextual interpretations and facilitating the development of a desired work group climate. This prediction is consistent with the notion that climate perceptions depend both on employees' subjection to formal practices and policies and on employees' interpretations of the behaviors likely to be supported in their work context as an HR system simultaneously serves as formal practice and dictates and signals the employee behaviors likely to be met by rewards (Bowen & Ostroff, 2004; Schneider, Brief, & Guzzo, 1996).

Accordingly, in the paragraphs that follow, I discuss my expectation that social capital-enhancing HR practices are likely to be instrumental in fostering a work group climate supporting trust, cooperation, shared language, and productive task conflict by promoting shared group member interactions which are conducive to intragroup relations with these characteristics. While much of the research on climate facilitation has been conducted at the organizational level, I expect that the mechanisms which have been found to be useful in fostering climate development at that level are likely to be equally – if not more – effective in climate facilitation in smaller collectives (i.e., work groups) (Anderson & West, 1998); thus, I draw on both organizational and group climate research in developing my predictions in this section.

A group social climate characterized by trust requires foundations in three components: ability, benevolence, and integrity (Mayer, Davis, & Schoorman, 1995). Specifically, work group members must a) feel confidence in fellow group members' competence, b) desire to do good for them, and c) believe that fellow group members' behavior is guided by principles of fairness. SCE HR practices can foster a work

context which facilitates these attitudes in work groups through initiatives such as within-group mentoring programs, external social events, fit-based selection, frequent group-wide meetings, peer evaluation mechanisms, and group-based incentive systems. For example, pairing experienced group members with employees who are new to a group allows group veterans to demonstrate their competence while sharing valuable knowledge to improve the skills and abilities of new members (Nahapiet, Gratton, & Rocha, 2005). Additionally, mentoring provides both members to the mentoring relationship the opportunity to interact and work together, which is likely to further facilitate the development of trust (Collins & Smith, 2006; Whitener, Brodt, Korsgaard, & Werner, 1998). Organization-sponsored social events provide opportunities for group members to interact and get to know one another outside of work, which may facilitate mutual benevolence by providing time for amicable, non-work-related interactions (Oh et al., 2004). Fit-based selection translates to selection of group members based on their fit with the existing members in the group. If employees are selected into a group based on their possession of similar values and demonstration of compatible personality relative to the rest of the group, group members are likely to collectively feel more similar to one another and thus to feel greater benevolence toward the group and believe more in one another's integrity (Brass, Galaskiewicz, Greve, & Tsai, 2004) – all supporting the development of a group climate of trust (Baron, Burton, & Hannon, 1996; Leana & Van Buren, 1999). Frequent group-wide meetings provide employees in a work group with regular opportunities to interact and to share their information and expertise, and thus to demonstrate their competence (Luthans & Youssef, 2004). Additionally, by providing a forum for information sharing, regular meetings facilitate open communication (Gittell, Seidner, & Wimbush, 2009), which allows group members an opportunity to demonstrate their integrity by sharing relevant knowledge with others. Peer

evaluation mechanisms and group-based incentive systems provide employees opportunities to demonstrate their ability and integrity to fellow group members as both mechanisms are likely to bring employees' relative performance and contributions to group goals to public awareness, thus contributing simultaneously to two prerequisites for trust.

Cooperation reflects collective personal efforts toward group, as opposed to individual, goals and is consistent with West's (1990) concept of task orientation in the group context. Like collective task orientation, cooperation is likely to be facilitated by simultaneous accountability of both the individual and the group, peer evaluation and monitoring mechanisms, and a general desire to achieve excellence in the task (Anderson & West, 1998). SCE HR practices thus are likely to facilitate norms of cooperation by providing incentives for the achievement of group goals (e.g., by providing the entire group progress reports of group performance, by basing bonus pay on group – rather than individual – performance (Leana & Van Buren, 1999), and by holding celebratory social events following group successes (Baron et al., 1996)) and ensuring that group members have both the ability (e.g., through skill-enhancement initiatives such as mentoring and skill-based compensation (Baron & Kreps, 1999)) and opportunity (e.g., by providing employees autonomy and empowerment in their work (Hage, 1999) and by pairing new and experienced employees in tasks (Nahapiet et al., 2005) to contribute to group outcomes.

The understanding and use of a shared language within a group represents a common understanding which enables employees to communicate and share ideas with one another more effectively (Collins & Smith, 2006; Nahapiet & Ghoshal, 1998). SCE HR initiatives such as mentoring, group-wide meetings, peer evaluation mechanisms, and external social events can be used to facilitate the development and use of a shared language within a group. Specifically, experienced group members

can use mentoring assignments as opportunities to share with new employees the common terms, symbols, and expressions used by the group in its work. Group-wide meetings focused on information sharing provide employees both an incentive and opportunity to learn the jargon used by other group members and for the group as a whole to establish common terms and symbols with which to communicate information and ideas (Gittel et al., 2009). Peer evaluation systems encourage group members to understand one another's work and ensure that their own work is understood by others (Kehoe & Collins, 2008) – providing an additional incentive for a group to establish a common language. As noted earlier, external social events provide opportunities for group members to interact outside of work, and through these shared experiences, group members may come to learn the jargon used by one another, thus establishing a shared language through a combination of the unique jargon used by multiple group members in their own work. Additionally, the more time people spend interacting and working together, the greater the likelihood that they will begin to naturally develop shared meanings, understandings, and language (Schneider & Reichers, 1983).

Task conflict involves disagreements among group members about the nature and performance of their work and can be productive in work groups responsible for complex or non-routine tasks requiring diverse perspectives (Jehn, 1995). SCE HR practices are likely to promote productive task conflict by providing group members the ability (e.g., through skill-based compensation and hiring from different functional backgrounds (Kehoe & Collins, 2008)), motivation (e.g., through bonus linkages with group performance), and opportunity (e.g., through the use of peer evaluation and scheduling of frequent group-wide meetings) to express different viewpoints about the group's work and the ways in which it can be completed most effectively.



*Hypothesis 1a: The use of social capital-enhancing HR practices will be positively related to work groups' social climates for trust, cooperation, shared language, and productive task conflict.*

***SCE HR practices and work groups' internal and external ties.*** Managers of work groups face unique challenges in facilitating the development of relationships between their employees and people external to the group. Specifically, while shaping a group's social climate is a difficult undertaking, managers performing this task have the advantage of managerial control over all actors relevant to climate emergence. On the other hand, managers attempting to facilitate the development of their group's social ties with other organizational members or with actors external to the organization have managerial influence over only one party in any potential relationship, thus limiting the managerial role which can be played. Additionally, for employees, establishing and maintaining relationships external to the group is likely to be more challenging and costly than growing existing relationships with fellow group members. For example, employees are likely to have less common ground, less motivation to establish a connection, and less opportunity to interact with actors external to the group than with their own group's employees (Adler & Kwon, 2002). Further, time spent interacting with external actors may translate to time not spent working on group tasks, whereas interactions with other group members are often required in completing group work (Hansen, Podolny, & Pfeffer, 2001). Thus, the effective management of groups' network ties requires managers to ensure that group members are adept in developing relationships, are provided incentives to establish ties outside of the group, and are given opportunities to interact with people in other parts of the organization as well as external to the firm. SCE HR practices are likely to meet all of these requirements. First, as Collins and Clark (2003) discussed in the context of top management teams, training covering the development of personal ties

both within and outside of the organization combined with the provision of specific feedback to employees on their abilities in relationship building is likely to improve group members' relationship development skills and thus their abilities to build internal and external ties. Second, reimbursement for conferences, continuing education, and association memberships, as well as compensation based on skills (which are likely to be enhanced through participation in these activities) are likely to provide employees the opportunities and motivation to spend time in locations and at events where other organizational members and important actors external to the organization are likely to be as well, thus increasing the likelihood that interactions will occur and relationships will form (Collins & Clark, 2003; Nahapiet et al., 2005). Finally, selection of employees into a work group from other areas of the firm increases the likelihood that they will already possess ties with other people in the organization (Gittel et al, 2009).

While these practices are likely to most immediately impact the number and range of work group members' internal and external ties, they are also likely to aid in facilitating strength in the internal and external relationships held by the work group over time. Specifically, relationship building training and feedback is likely to provide employees with the skills necessary not only to meet and interact with a large variety of people, but also to more effectively transition from casual interactions to more involved, trust-filled relationships, characterized by repeated exchanges, with actors outside the work group. Additionally, reimbursement for extraorganizational development opportunities – particularly conference attendance and association memberships – is likely to increase the likelihood that employees will often have multiple and frequent opportunities to interact with previously established tie partners, particularly given the high probability that others will continue to attend the same rounds of conferences and maintain membership in the same associations over time.

*Hypothesis 1b: The use of social capital-enhancing HR practices will be positively related to the number, range, and strength of work groups' internal ties.*

*Hypothesis 1c: The use of social capital-enhancing HR practices will be positively related to the number, range, and strength of work groups' external ties.*

### **Work Group Social Capital and Access to Knowledge and Tangible Resources**

Following Adler and Kwon, I define social capital as “the goodwill available to individuals or groups. Its source lies in the structure and content of the actor’s social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor” (2002: 23). In the discussions that follow, I consider the role of work groups’ social capital –embedded in group social climates and internal and external ties – in facilitating access to knowledge and tangible resources. Importantly, the multiple sources of work groups’ social capital can be differentiated as stemming from bonding (or closure) (e.g., Burt, 2000; Coleman, 1988; Putnam, 1995) and bridging (e.g., Baker, 1990; Burt, 1992, 2000) ties, with important implications for the mechanisms by which benefits are likely to be derived from each (Adler & Kwon, 2002). In particular, the nature of the collective bonding ties associated with a work group’s social climate are likely to impact the extent to which the group as a collective is able to draw and build on the knowledge held by its individual members, whereas the characteristics of group members’ ties outside of the group are likely to influence the type and amount of resources available to the group from specific external sources (Burt, 2000; Oh et al., 2004). Accordingly, I examine the role of group social climate and the roles of internal and external ties in facilitating group resource access in two separate sections below.

***Work group climate and access to knowledge.*** The characteristics of an organization’s social climate have been shown to impact employees’ capabilities and collective performance outcomes (Collins & Smith, 2006; Smith, Collins, & Clark,

2005), suggesting consistency of social climate with the definition of social capital mentioned above and more specifically with Adler and Kwon's (2002) distinction of internal social capital (as compared to external social capital), which focuses on features of a collectivity that facilitate the pursuit of common goals.

The primary source of advantage associated with bonding relationships (or equivalently, with closure in a collective) is the notion that all of the interactions among members of the collective are governed by (if they exist) the norms of that collective, thus increasing the predictability and reducing the risk associated with exchange between individual members (Burt, 2000; Coleman, 1988). Thus, whereas dyadic exchanges taking place outside of a strong collective context are likely to depend on the specific history of interactions between the two actors involved, exchanges occurring in the context of a clearly identified collective are likely to depend more on the collective climate and rely less on the history between the particular parties to the exchange (Leana & Van Buren, 1999). Further, specific norms governing behaviors in a collective can provide the direction needed for collective action, thus facilitating members' actions toward a common goal (Adler & Kwon, 2002; Coleman, 1990). Consistent with these notions, I predict below that members of work groups whose social climates are characterized by trust, cooperation, and productive task conflict are likely to be more willing and motivated to share their knowledge with other members of their group, which in turn will positively impact the group's overall knowledge access. In addition to affecting motivation to pursue a common goal, the social climate of a collective is likely to impact members' *abilities* to work together effectively, as well. For example, as I discuss below, the development and use of a shared language in a work group is likely to impact the quality and clarity of group members' communications and the extent to which group members' recognize the value in one another's knowledge.

I expect the nature of a work group's social climate to facilitate or hinder the group's ability and propensity to access the existing knowledge of its members by supporting a context which is more or less conducive to knowledge exchange (Blyler & Coff, 2003; Collins & Smith, 2006). Several scholars have studied the conditions under which knowledge exchange is most likely. For example, social climates emphasizing trust, cooperation, shared codes and language, shared mental models, risk-taking, and teamwork have been theoretically and empirically linked with higher levels and lower costs of exchange of knowledge in organizations (Collins & Smith, 2006; Haas & Hansen, 2007; Mohammed & Dumville, 2001). Here, as I have noted, I focus on four *work group* climate dimensions which are likely to be particularly important in promoting work groups' access to knowledge based on their facilitation of knowledge exchange within the group: trust, cooperation, shared language, and productive task conflict.

A social climate characterized by high levels of trust is likely to facilitate knowledge exchange (and thus provide knowledge access) in work groups by creating a context which promotes employees' collective opportunities and willingness to share information with other group members (Nahapiet & Ghoshal, 1998). Of particular relevance here is the role of the work group context and the distinction between dyadic and generalized trust, which suggests a potential for efficiency benefits associated with knowledge access within a work group as compared to group members' access to knowledge from external actors. Specifically, dyadic trust refers to trust which exists between two actors based on their direct knowledge of each other (Leana & Van Buren, 1999). I argue in later sections that the exchanges between group members and their internal and external tie partners are likely to rely on this type of trust. On the other hand, generalized trust rests in the norms associated with a particular collective and is thus extended to individuals within that collective based solely on their

membership (Burt, 2000; Leana & Van Buren, 1999). As a result, the members of work groups whose climates are characterized by high levels of trust are likely to be afforded trust of this generalized nature, such that interactions and exchanges within the group which require trust can take place even in the absence of previously existing personal relationships between the particular individuals involved. Below I make specific arguments concerning the ways in which high-trust social climates are likely to promote within-group knowledge access.

A high-trust social climate is likely to facilitate group members' access to one another's knowledge based on the generalized belief within the climate of others' good intentions (Nahapiet & Ghoshal, 1998). In particular, I expect group climates supporting trust to improve in-group knowledge access by increasing the extent to which group members a) believe that other members' behaviors will be guided by reciprocity (Adler & Kwon, 2002; Coleman, 1990; Kachra & White, 2008), b) are willing to be vulnerable with one another (Schoorman, Mayer, & Davis, 2007), c) are open to others' perspectives (Nahapiet & Ghoshal, 1998), and d) are comfortable taking personal risks in decisions and behaviors at work (Edmondson, 1999; Schoorman et al., 2007).

Norms of reciprocity inherent in high-trust social climates dictate that group members both use and handle shared information in the intended way and in turn share their own relevant information or knowledge at the appropriate future time (Collins & Smith, 2006; Nahapiet & Ghoshal, 1998), which I expect to play an important role in increasing group members' willingness to share knowledge with other members. In particular, reciprocity norms create a direct incentive for extensive knowledge exchange in a social context: the more actors share their knowledge, the more likely it is that they will acquire the knowledge they need. Kachra and White (2008) found empirical support for this notion in an interpersonal relational context: when R&D

scientists reported an expectation of reciprocity in their relationships, the relationships were characterized by a greater two-way exchange of information and advice.

The increased openness to vulnerability in a high-trust social context (Schoorman et al., 2007) is likely to facilitate knowledge access in work groups with high-trust climates by increasing group members' willingness to ask for help and admit mistakes. In particular, if employees feel confident that they will be met with collegial support as opposed to embarrassment when they admit a weakness or mistake, they may be more likely to ask questions or seek feedback in areas where other group members' knowledge or expertise may be particularly useful (Edmondson, 1999). In this way, a high-trust climate can increase knowledge access through its impact on group members' willingness to *seek* knowledge from one another.

High-trust climates are likely to cause work group members to be more open to one another's ideas and perspectives based on confidence in others' abilities (Mayer et al., 1995) and the resulting increased likelihood of perceiving value in others' intellectual contributions (Nahapiet & Ghoshal, 1998). These value perceptions are likely to provide greater incentives for group members to seek and share knowledge within the work group, thus leading to improved within-group knowledge access.

Finally, work groups with climates characterized by trust are likely to experience greater internal knowledge access based on the increased willingness of group members to take risks with one another (Nahapiet & Ghoshal, 1998; Ring & Van De Ven, 1992). In particular, a greater willingness to take risks is likely to translate into experimentation in sharing new or less developed knowledge which members may not otherwise feel comfortable making public (Nahapiet & Ghoshal, 1998) and into increased participation in problem-solving efforts – leading to insights from group members who may not otherwise have made intellectual contributions (Edmondson, 1999).

Social climates supporting cooperation are likely to facilitate the exchange of knowledge within work groups by increasing employees' opportunity and motivation to share knowledge with others in their group (Collins & Smith, 2006; Nahapiet & Ghoshal, 1998). First, norms of cooperation are likely to increase social interaction among group members (Chen & Huang, 2007), which is likely to strengthen interpersonal relationships and create and/or improve the communication channels available for exchange (Hoegl, Parboteeah, & Munson, 2003). This is likely to increase the opportunity for knowledge exchange within a group in two ways. First, interpersonal interactions are an important source of information about available knowledge (Burt, 1992); thus, as group members interact socially more often, their chances of identifying valuable exchange opportunities with other group members is likely to increase (Moran & Ghoshal, 1999). Second, well established, repeatedly used communication channels are capable of supporting the exchange of more complex knowledge (Hansen, 1999), such that the members of groups with norms of cooperation are likely to be able to share intangible and contextual knowledge whose transfer would likely be impossible in less cooperative contexts.

A climate of cooperation is also likely to increase internal knowledge access by increasing group members' motivation to share knowledge with one another in two ways. First, a climate of cooperation encourages norms of collaboration over competition within the group. In such a context, where employees believe that they will be socially rewarded for acting as a team and penalized for refusing to work together, knowledge exchange among group members is likely to be more frequent, substantial, and meaningful (Smith et al., 2005). Second, and relatedly, employees' motivation to exchange knowledge is affected by a cooperative climate based on the importance placed on collective goals (Adler & Kwon, 2002; Nahapiet & Ghoshal, 1998), which are likely to provide the basis for behavior (Guzzo & Shea, 1992) and



evaluation (Leana & Van Buren, 1999).

A social climate supporting shared language is likely to increase knowledge exchange in work groups by improving members' abilities and motivation to share knowledge with one another (Nahapiet & Ghoshal, 1998). Research at multiple levels of analysis indicates that, in order for the recipient in knowledge transfer to effectively assimilate and use new knowledge, some prior related knowledge is required (Cohen & Levinthal, 1990). At the individual level, specifically, it has been suggested that the knowledge an individual possesses is organized into conceptual categories. As the individual is presented with new knowledge, his or her ability to acquire and process that knowledge is likely to depend on the extent to which he or she can make sense of it in terms of these pre-existing categories (Bower & Hilgard, 1981). Language has been demonstrated to be an important filtering and organizing mechanism, acting as a cognitive framework in this knowledge acquisition process (Nonaka & Takeuchi, 1995). In particular, an individual's language determines whether particular concepts are identified by terms and thus dictates which new concepts or pieces of information are filtered into an existing conceptual category when new knowledge is presented (Nahapiet & Ghoshal, 1998). Thus, to the extent that group members speak different languages (e.g., through the use of function-specific jargon with which other group members are not familiar), their ability to access one another's knowledge or even recognize its potential value is likely to be limited. Therefore, the development and use of a shared language within a work group is likely to be useful in facilitating communication and shared understandings and thus in promoting intragroup knowledge exchange which may otherwise be unlikely or impossible (Kogut & Zander, 1992; Szulanski, 1996).

Finally, a climate supportive of productive task conflict is likely to be conducive to knowledge sharing in a group context for two reasons. First, group

members are likely to feel more comfortable expressing potentially contrasting insights and presenting conflicting information in an environment which accepts disagreement and debate (Jehn, 1995; West & Anderson, 1996). In combination with norms of trust and cooperation among group members, the existence of productive task conflict is likely to foster a safe atmosphere for diverse exchange, thus increasing the likelihood that the entire group will gain access to the knowledge of all of its members. In contrast, when individuals feel a sense of threat in discussing work-related problems or challenges, they are less likely to offer their expertise or otherwise participate in a group's problem-solving activities (Edmondson, 1999). Second, a climate which encourages productive task conflict is likely to improve a group's collective cognitive understanding of task-related problems (Simons & Peterson, 2000), which is likely to increase the number and quality of intellectual contributions made by group members (De Dreu, 2006).

*Hypothesis 2: Work groups' social climates for trust, cooperation, shared language, and productive task conflict will be positively related to access to knowledge.*

***Work group internal and external ties and access to knowledge.*** Groups in organizations face several challenges in accessing resources existing beyond their boundaries – even resources possessed by actors within the limits of the organizations in which they operate. Specifically, first, organizations are likely to have multiple projects in progress simultaneously, so organizational resources must be allocated among several work groups at any given time (Hansen, Mors, & Lovas, 2005; Tsai, 2002). Therefore, it is unrealistic to assume that a work group will have all of its organization's resources available for its activities. Second, research has demonstrated that organizations' resources are often not distributed equally across employee groups or projects (e.g., Brown & Eisenhardt, 1995; Hansen, 1999),

suggesting it is furthermore unrealistic to assume that a work group will have even a particular portion of the organization's resources available for use. Finally, organizational members face several obstacles in the actual acquisition of resources and learning of competencies from other parts of their organizations, so even "available" resources may not necessarily be *accessible* for the work group's purposes (Hansen, 1999; Szulanski, 1996).

A work group's external social capital is likely to impact the group's ability to effectively and efficiently access knowledge beyond the group's boundaries. Specifically, three characteristics (i.e., number, strength, and range) of work group members' social ties both with other organizational members (i.e., internal ties) and with actors external to the organization (i.e., external ties) are likely to affect the group's knowledge access. In this section, I begin by examining the unique importance of internal and external ties. I then discuss the ways in which the number, range, and strength of a work group's internal and external social ties are likely to impact the group's ability to access knowledge existing outside of the group.

Internal social ties represent a work group's connections with the rest of the organization in which it operates. Earlier I discussed some of the challenges associated with knowledge and tangible resource exchange between members and units of the same organization (e.g. lack of awareness of resource availability; lack of willingness to exchange, difficulty in acquisition); work group members' social ties with organizational members external to the group can help to overcome some of these obstacles to intraorganizational exchange. As I will explore below, the nature of a work group's internal ties (i.e., the number, range, and strength of these relationships) is important in determining the extent to which these obstacles act as barriers to resource exchange and thus the degree to which the work group can benefit from access to knowledge located in other parts of its organization.

External social ties represent a work group's connections with actors external to the organization. To date, scholars examining interorganizational ties have tended to focus on ties held by an organization's top managers, reasoning that top managers are an organization's primary boundary spanners (Leana & Pil, 2006). Yet this focus is likely to be problematic in two ways. First, this focus carries an assumption that all organizational members will reap the benefits of top managers' external ties based on membership in the organization. However, as I discussed earlier, organizations usually have multiple projects taking place simultaneously, and groups throughout an organization thus compete for the finite resources available in the firm (Hansen et al., 2005; Tsai, 2002). Therefore, it is unlikely that all project groups within an organization are likely to benefit fully from top managers' external ties.

Second, a sole focus on top managers' ties with other organizations ignores the importance of ties between individuals directly engaged in an interaction. For instance, Rousseau, Sitkin, Burt, and Camerer (1998) discussed the difference between institutional trust (which is granted based on membership in a trusted organization) and relational trust (which is based on goodwill established through individual interactions) in interorganizational relationships, noting that institutional trust tends to be applied only to formalized, governed transactions, whereas relational trust is more likely to be generalized over time and therefore span unprecedented circumstances. Thus, while a work group may be afforded institutional trust with an external tie partner of its top management team, the group is likely to reap more substantial benefits from establishing personal external ties based on the resulting increase in those tie partners' willingness to exchange knowledge. Again, the nature of external tie benefits is likely to depend on tie characteristics, which I discuss next.

The number of internal and external ties held by a work group represents the sum of people both within and external to the organization with whom the work group

has direct connections. Work groups with large numbers of social ties are likely to experience knowledge access benefits in the form of increased awareness of knowledge availability, increased willingness of other actors to share knowledge, and greater efficiency in knowledge acquisition (Brown & Eisenhardt, 1995; Burt, 1992; Smith et al., 2005).

Actors in organizations are often not aware of the existence or location of knowledge residing in other parts of the organization; social ties with many other organizational members can increase the work group's awareness of the availability of knowledge or expertise and of opportunities for exchange elsewhere in the firm (Hansen, 1999; Smith et al., 2005). Further, as I mentioned previously, knowledge and resource exchange among organizational units is not an automatic occurrence (even when an awareness of the resources exists). In some cases organizational actors are unwilling to share or exchange their knowledge or resources even when they have been requested; a work group's social ties with other organizational members are likely to influence the willingness of these contacts to share knowledge based on familiarity with and goodwill toward work group members, so having many ties in other parts of the organization is likely to translate to a larger number of actors willing to share knowledge and resources with the work group (Burt, 1992; Hansen, 1999; Rodan & Galunic, 2004). In turn, the increased awareness by the work group of knowledge availability and the increased willingness of other actors in the organization to share knowledge are likely to improve the efficiency with which the work group is able to identify and obtain relevant knowledge, thereby freeing up time for the work group to pursue additional knowledge acquisition opportunities in other locations.

While external ties are likely to provide work groups with greater access to knowledge in similar ways to internal ties (i.e., through increased awareness of

knowledge availability, increased willingness of external actors to share knowledge, and improved efficiency in knowledge acquisition), the number of external ties in a work group may have unique importance for knowledge access. Specifically, the knowledge awareness, exchange willingness, and acquisition efficiency benefits associated with internal ties may be obtainable through different organizational means, which are less likely to be available in accessing external knowledge or other resources. For example, a formal knowledge management system or organizational newsletter may facilitate awareness of knowledge availability throughout an organization (Haas & Hansen, 2007), a collaborative organizational culture may increase organizational members' willingness to share knowledge even in the absence of direct ties, and intraorganizational knowledge storage systems and databases may facilitate efficiency in knowledge transfer with limited or no necessary contact between the source and receiver of the exchange (Haas & Hansen, 2007). On the other hand, such formal knowledge sharing mechanisms are substantially less likely to exist in interorganizational exchange contexts. Therefore, without direct ties, work groups are less likely to be aware of knowledge exchange opportunities with actors external to their organization, and potential external exchange partners will have little or no incentive to provide access to their knowledge; thus, knowledge acquisition is likely to require additional time, effort and resources which are then unavailable for other knowledge acquisition pursuits or alternative work activities.

Tie (or network) range refers to the scope or diversity of actors with which a work group is connected and has been linked to heterogeneity in the types of information and other benefits available through a set of ties (Smith et al., 2005). The range of a work group's internal and external ties is likely to determine the scope of knowledge which is accessible to the group through these contacts, as tie partners spanning a broader range of functional and experiential backgrounds are likely to

possess a greater variety of information collectively than would a more homogenous set of tie partners (Oh et al., 2004; Smith et al., 2005). Therefore, work groups with a larger range of internal and external ties are likely to have access to a wider variety of knowledge and are thus more likely to have access to the knowledge necessary for the particular needs of their work.

Tie strength has been defined as affective closeness, frequency of interaction, and duration in a relationship (Burt, 1992; Hansen, 1999; Smith et al., 2005). Strength in ties has been linked with trust, cooperation, and increased absorptive capacity at the individual and organizational levels (Adler & Kwon, 2002; Brown & Eisenhardt, 1995; Soh, 2003). On the other hand, tie strength has also been associated with time- and resource-related obligations, limitations in search breadth and efficiency, and redundancy in information benefits (Adler & Kwon, 2002; Burt, 1992; Hansen, 1999).

While the mere existence of social ties between a work group and other organizational members is important for establishing potential for effective knowledge exchange, in some cases the mere presence of ties is insufficient to optimize the exchange that ultimately occurs. Strength in these ties can help to further promote the likelihood that knowledge exchange will actually occur as well as impact the type of knowledge which is able to be transferred across the ties. For example, Kachra and White (2008) found that actors were significantly more likely to share knowledge across ties characterized by stronger social relationships, which were more likely to carry an expectation of reciprocity with exchange than were other ties. Further, scholars have demonstrated a negative impact of perceptions of competition (Hansen et al., 2005) and lack of trust (Levin & Cross, 2003) on actors' willingness to share knowledge with one another, reflecting the importance not only of establishing ties but also of investing in the strength of positive relationships within those ties for the facilitation of conditions conducive to future knowledge exchange.

Additionally, while the presence of ties is critical for any type of knowledge transfer, *strong* ties have been shown to be necessary to support the exchange of complex information both within and across organizations (Hansen, 1999; Soh, 2003) – an important consideration in the context of work groups responsible for elaborate organizational renewal processes. Internally, Hansen (1999) found that stronger ties resulted in the capacity to exchange more complex knowledge across units within a firm. In considering external ties, Soh (2003) argued that when two organizations interact on multiple occasions (a characteristic of strong tie relationships), there is an increased likelihood that effective and efficient communication channels capable of supporting rich communication will develop between them. Given the complex nature of the information, knowledge, and expertise employed by groups attempting to adapt and innovate, in the context of renewal processes, strength in ties is likely to improve work groups' access to valuable knowledge existing both within and beyond organizational boundaries.

*Hypothesis 3: The number, range, and strength of work groups' internal ties will be positively related to access to knowledge.*

*Hypothesis 4: The number, range, and strength of work groups' external ties will be positively related to access to knowledge.*

***Work group internal and external ties and access to tangible resources.***

Social capital research examining the consequences of organizational actors' network ties often includes increased access to resources among the list of beneficial outcomes of positive relationships with others. However, empirical studies in this area tend to adopt narrow definitions and operationalizations of resources which primarily include only intangible resources, such as knowledge (e.g., Hansen, 1999; Hansen, Mors, & Lovas, 2005; Smith, Collins, & Clark, 2005; Tsai, 2001, 2002; see Tsai, 2000 for an exception). While, as I have discussed, access to knowledge possessed or controlled



by another actor or group often requires the presence of a relationship which is supportive of communication and exchange, the challenges faced by work groups in obtaining access to many types of resources in their organizations suggests that the development of personal relationships is likely to be useful for groups in obtaining access to tangible resources as well.

Internal and external ties both hold potential to aid work groups in overcoming the barriers to accessing tangible resources within their firms; however, these two types of ties are likely to function differently in this process. Specifically, I expect internal ties to increase a work group's access to tangible resources both a) indirectly by contributing to the group's legitimacy throughout the organization; and b) directly (in the case of strong ties) based on tie partners' anticipation of reciprocity and confidence in the group's trustworthiness. On the other hand, I expect external ties to have mostly indirect effects on a work group's access to tangible resources, with benefits emerging primarily from the work group's abilities to broker exchanges and introductions between other organizational members and the group's external tie partners.

The number of internal ties possessed by a work group is likely to impact the group's access to tangible resources based on its effect on the group's legitimacy and resulting ability to obtain buy-in for its work. Specifically, the very tie partners who can assist a work group by sharing knowledge are the same actors who filter and spread the information that is communicated to others about the work group in other parts of the organization (Burt, 1997). Thus, the greater the number of actors to whom a work group is directly connected, the larger the community of people who are likely to spread positive information about the group and its activities, thereby providing the group legitimacy in the eyes of actors who are unconnected to and potentially unaware of the group and its work (Burt, 1997). In turn, increased legitimacy is likely to

translate to increased willingness of other organizational members to contribute tangible resources which are under their control to the group's activities based on an increased belief in the value and potential of the group as a performing unit (Lounsbury & Glynn, 2001).

Work groups can also use their internal ties as channels for political communication, which can be strategically managed to obtain tangible resource access, as well. For instance, Brown and Eisenhardt (1995) discussed ways in which groups in organizations could use political communication both to improve others' impressions of them and to obtain top management support for the group's projects. With a more positive reputation throughout the organization in addition to backing from top management, a work group is likely to be better able to secure favorable terms in negotiation and resource exchange with other organizational actors.

I expect the number of external ties possessed by a work group to impact the group's access to tangible resources based on its effect on the group's ability to bridge structural holes between other organizational members and the group's external tie partners. Burt (1997) explored ways in which actors could use their social connections to bridge structural holes between other organizational members in order to gain control over available opportunities and resources. In Burt's example, focal actors managed their intraorganizational ties such that other organizational members depended on them for some resource or aid. Based on these dependencies, the focal actors were able to exert influence with respect to many other organizational actors to their own benefit. In an extension of this strategy to the present scenario, a work group which is connected to many actors external to the organization is likely to be well positioned to broker exchanges between actors in its own organization and those external actors. In turn, the indebted actors in the group's own organization could then be useful to the group in gaining tangible resource access within the firm – either

by providing direct access to tangible resources or by connecting the group to well endowed organizational members or units. This progression is also consistent with Cohen and Bradford's (1989) discussion of the process of intraorganizational influence and exchange, in which the authors suggest that employees can often secure needed resources by determining and fulfilling the needs of other organizational members who control the resources desired.

Tie range is likely to play a similar role in a work group's ability to access tangible resources as the number of the work group's ties. However, whereas the number of internal ties held by a work group affects the *number* of people who are likely to communicate positive information about the group to others, the range of a work group's internal ties impacts the *heterogeneity* of these actors, which is likely to be helpful in promoting the group's legitimacy across a broader set of functional areas within the organization and across more diverse actors and organizations external to the firm. Similarly, the range of a work group's external ties is likely to impact the scope of transactions which the group is able to broker between internal and external actors, thus impacting the likelihood that the group is able to provide a worthwhile service to other members of its organization. As a consequence, work groups with a wide range of ties are likely to be positioned to obtain access to tangible resources which are in the possession of a broader scope of internal actors.

Strong social ties are characterized by trust and reciprocity (Kachra & White, 2008), which are not automatic dimensions of interpersonal relationships within organizations (Hansen, 1999). Thus, work groups with strong internal social ties are likely to be in better positions to obtain access to tangible resources based on higher levels of trust and greater readiness to provide assistance or engage in exchange by fellow organizational members (Cohen & Bradford, 1989; Tsai, 2000). Specifically, these work groups' increased tangible resource access is likely to be a result of other

organizational members' feelings of goodwill and beliefs that the work group will act benevolently and in the best interest of them and of the organization as a whole (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998).

Additionally, due to the increased reciprocity found in strong relationships, both organizational members and actors external to the organization are likely to more readily spread positive messages about the members and activities of a work group to whom they are strongly tied, resulting in an increase in the group's ability to obtain access to tangible resources held by organizational members to whom it is not directly connected as well.

*Hypothesis 5: The number, range, and strength of work groups' internal ties will be positively related to access to tangible resources.*

*Hypothesis 6: The number, range, and strength of work groups' external ties will be positively related to access to tangible resources.*

### **Access to Knowledge and Work Group Adaptability and Innovativeness**

At the beginning of this paper, I noted the importance of knowledge to organizations' renewal capabilities. I then argued that work groups are not necessarily always able to access the knowledge held in other parts of their organizations due to challenges associated with limited availability and barriers to transfer. I have spent the remainder of the paper, up to this point, exploring the ways in which work groups' abilities to access knowledge (and tangible resources) could be enhanced. In the discussions that follow, I examine the importance of work groups' knowledge access in determining their abilities to adapt and innovate. In particular, in the first section below I discuss the multistage nature of the adaptive cycle and the importance of groups' knowledge access in all four phases: situation assessment, plan formulation, plan execution, and group learning. In the second section, I consider the role of knowledge access in the context of innovation – defined here as new knowledge

creation and/or implementation.

***Access to knowledge and work group adaptability.*** Adaptation is a multistage process in which successful outcomes require work groups to perform a progression of diverse yet interrelated behaviors and often to solve new and unfamiliar problems (Burke, et al., 2006; Pulakos, Arod, Donovan, & Plamondon, 2000). Following a review of conceptualizations of adaptation and adaptive performance which have appeared in recent literature, I define group adaptability here as a capability enabling work groups to adjust strategies, behaviors, and processes (Salas, Sims, & Burke, 2005) in a timely manner (Kozlowski, Gully, Nason, & Smith, 1999) in order to effectively respond to environmental or internal cues (Burke et al., 2006) indicating present or future discrepancies between the group's current trajectory and expected or unexpected performance demands (Rousseau et al., 2006). In the following discussion I provide a general framework of group adaptive performance, outline the behaviors required at each stage of the process, and discuss the ways in which work groups' access to knowledge is thus likely to impact their adaptability.

Scholars have identified several behavioral stages and components as critical to group adaptation (e.g., Burke et al., 2006; Han & Williams, 2008; Rousseau et al., 2006). I rely here on Burke et al.'s (2006) four-phase adaptive cycle as a general process framework for three reasons. First, this model is inclusive: many of the microprocesses identified in other adaptation models fit cleanly into one of Burke et al.'s (2006) four phases, allowing me to combine insights from several perspectives while maintaining the structure provided by a single model. Second, Burke et al.'s (2006) model is generalizable: the four phases of the cycle are likely to be applicable to work groups across a variety of contexts and task domains. Third, the model incorporates a learning component as its final stage, enabling groups to gain knowledge from the adaptation process in order to adapt more effectively in the future.

This final point is particularly important here because it supports the development and improvement of a group's adaptability – a capability which extends success in individual adaptation episodes to the capacity to repeatedly adapt across a variety of situations and over time (Helfat et al., 2007).

Work groups' ability to access knowledge is critical to their performance in all four phases of Burke et al.'s (2006) adaptive cycle: situation assessment, plan formulation, plan execution, and group learning. As I will discuss below, each of the phases in the adaptive cycle requires work group members to combine and integrate multiple types of knowledge from a variety of sources – processes for which access to knowledge is a fundamental requirement (Smith et al., 2005). And while it may be possible to assign adaptation-oriented tasks to one or two particularly capable, well connected, and resourceful individuals, this type of delegation can leave a group overly dependent and vulnerable with respect to these employees' contributions and fails to improve the adaptability of the group as a whole (Teece, 2007). Thus, the knowledge access of the work group as a collective is key to success throughout the adaptive cycle.

The first stage in the adaptive cycle, situation assessment, involves environmental scanning (Burke et al., 2006; Rousseau et al., 2006), cue recognition (Salas et al., 2005), and problem definition and exploration (Chattopadhyay, Glick, & Huber, 2001; Rousseau et al., 2006). To the extent that work groups have access to a wide range of knowledge sources and regularly make use of their external communication channels, access to knowledge outside the group is likely to serve as a low-cost environmental scanning mechanism (Burt, 2000). In particular, knowledge sources in other parts of the organization or external to the organization are likely to possess information about conditions and changes in the external environment; the ability to scan the environment through the mere collection of this knowledge is likely

to save groups time and resources which would otherwise be required for large-scale data collection efforts. Through the course of a group's evaluation of the environment, cue recognition results from the group's classification of information based on the group's shared mental models (Burke et al., 2006). Specifically, by comparing new information to the group's existing knowledge structures, group members determine whether new environmental information indicates a threat or need for change (Chattopadhyay et al., 2001). Group members' access to one another's knowledge is likely to be particularly important in this process, since shared mental models are only likely to be created and maintained through the exchange and integration of group members' individually held knowledge (Nonaka & Takeuchi, 1995). Finally, given a group's recognition of an environmental cue indicating the need for revised collective action, problem definition and exploration ensue – involving the gathering of additional information from the environment (Chattopadhyay et al., 2001; Rousseau et al., 2006) and further comparison of new information with the group's existing knowledge and mental models, thus representing additional need for knowledge access within and outside of the group.

Plan formulation, the second phase in the adaptive cycle, requires the identification of potential responses (Rousseau et al., 2006) followed by the selection of the best solution to the challenge (Pulakos et al., 2000; Rousseau et al., 2000). This phase involves a two-step process of idea generation and evaluation. Idea generation, which is consistent with brainstorming (Osborn, 1962), relies on two principles which are likely to create advantages for work groups with extensive access to the knowledge of group members and external actors: a) idea quantity is desired, and b) combination and improvement are sought (Amabile, 1996). Thus, in this process, work groups whose members freely exchange knowledge are likely to generate a greater number of potential responses to problems and more effectively build on one another's solutions

(Rousseau et al., 2006).

Work groups' collective access to their members' knowledge is likely to make diverse perspectives available in the evaluation of proposed solutions, as well, thus increasing the likelihood that inappropriate solutions will be detected and potentially fruitful options identified in this stage (Stevens & Campion, 1994). In particular, group members who participate in this process can collectively reflect on their experiential knowledge in determining which solutions may be most likely to work (Burke et al., 2006; Tjosvold, Yu & Hui, 2004), such that greater access to group members' knowledge provides a larger body of experience on which the group can draw in its decision.

The third phase of the adaptive cycle, plan execution, requires the coordination of group members to implement the selected course of action (Burke et al., 2006; Han & Williams, 2008). I would expect that the possession of shared mental models and a transactive memory system are likely to be critical in this phase – both requiring mutual knowledge access among the members of a group. By establishing shared mental models around the problem, the solution, and the plan for implementation, a work group can ensure that all of its members have a clear understanding of the execution task and are able and prepared to provide support for other members in the case of mistakes or unexpected circumstances (Burke et al., 2006). These capabilities are likely to be particularly important given that adaptive responses often require plans which are based on incomplete information and actions which fall outside of the realm of regular work behaviors (Han & Williams, 2008; Pulakos et al., 2000).

A transactive memory system, which emerges from group members' combination and utilization of one another's distributed knowledge, provides group members with a) a knowledge of who knows what within the group, b) confidence in the respective knowledge of each group member, and c) the ability to coordinate tasks



based on task members' relevant skills and abilities (Zhang, Hempel, Han, & Tjosvold, 2007) and is likely to be critical in groups' abilities to assign adaptive tasks appropriately. In particular, to the extent that group members are assigned execution tasks which are consistent with their knowledge and previous experience, all group members should be able to focus on their own assignments with minimal distraction or disruption. On the other hand, if group members are assigned tasks which are beyond their abilities, substantial time will be required for support and rework (Burke et al., 2006; Hollingshead, 1998), which is likely to detract from the effectiveness of the intended plan.

Group learning, the final phase of the adaptive cycle, involves reflecting on the previous three phases, seeking feedback on the outcomes of the overall adaptive process as well as of specific decisions and actions, and developing and improving a group-level understanding of the entire situation in order to incorporate lessons into group structures and routines (Burke et al., 2006). The role of groups' knowledge access may be most important to this final phase. Collective reflection on the adaptive process requires access to individual group members' experiences and perspectives, and feedback on decisions and outcomes is likely to require updated information from the environment (Burke et al., 2006). Further, the development of a group-level understanding of the entire situation requires a convergence of group members' viewpoints and the subsequent revision of shared mental models (Levitt & March, 1988). Thus, for effective learning to occur in this final phase, group members must extensively share knowledge, reflections, and new ideas and be proactive in seeking new knowledge by asking questions, comparing experiences, and critically evaluating performance feedback in the context of both the group and the larger environment (Edmondson, 1999).

*Hypothesis 7: Work groups' access to knowledge will be positively related to adaptability.*

***Access to knowledge and work group innovativeness.*** Because innovation can arise from a wider range of motivations and scenarios than can adaptation (which is necessarily guided by the recognition of and subsequent response to a specific cue), the innovation process has the potential to follow a more open-ended course and is thus likely to be less consistently characterized by a generic framework than adaption. This holds particularly true given my conceptualization of innovation as the creation or implementation of new ideas (or more broadly, knowledge) by a group for the purpose of improving the group and/or organization in some way (DeDreu & West, 2001; West & Farr, 1990) – a definition allowing innovations to initially emerge from circumstances of chance, experimentation, discontent with the status quo, etc. Nonetheless, it is possible to identify requirements that span all types of innovation and thus to discuss prerequisites to groups' innovative capabilities; I discuss the importance of groups' access to knowledge for innovation below.

While innovation can materialize in a variety of forms, the definition above suggests two primary categories of innovative activities: creation and implementation of new knowledge. I discuss both types of innovation and the importance of a group's access to knowledge for each separately. The ability to create new knowledge depends on a group's capacity to combine and integrate existing knowledge in original ways (Kogut & Zander, 1992; Smith et al., 2005), which requires that groups have some level of knowledge access in order to have ideas to combine and integrate (Nahapiet & Ghoshal, 1998; Smith et al., 2005). However, worthwhile knowledge is unlikely to be created through a simple reorganization of related information into new forms (Nonaka & Takeuchi, 1995). Rather, meaningful knowledge creation requires the development of new distinctions, ideas, and insights (Nonaka & von Krogh, 2009)

based on the integration of diverse perspectives (Tsai & Ghoshal, 1998; Un & Cuervo-Cazurra, 2004) and the expansion of existing cognitive boundaries (Nonaka & Takeuchi, 1995; Tsoukas, in press).

While several perspectives on the knowledge creation process have been proposed in the literature, a common thread throughout them is a requirement for conceptual expansion of some form. For example, Nonaka and Takeuchi (1995) suggest that knowledge creation is likely to require the integration of explicit and tacit knowledge through a process involving “collective reflection” where group members use analogy and metaphor to convey tacit knowledge to one another. In this view, group members’ cognitive frames are extended in the creation of shared understandings when an analogy is used to bridge the gap between existing mental models and newly presented knowledge (Nonaka, von Krogh, Voelpel, 2006). In another perspective, Tsoukas (in press) discussed conceptual development in the knowledge creation process as a precursor to drawing new distinctions and insights. In particular, Tsoukas suggested that conceptual development could take the form of combining two existing concepts, extending the use of a single concept into a new realm, or reframing the classification of a concept such that different characteristics of the concept are emphasized.

The common requirement for conceptual expansion in knowledge creation points to the unique importance of work groups’ access to internal and external knowledge in their abilities to innovate. First, given that I am examining the work group as the primary locus of knowledge creation, collective access to work group members’ knowledge is likely to be critical in fostering an effective knowledge creation context (e.g., Nonaka & Konno, 1998; Nonaka von Krogh, 2009). In particular, knowledge creation requires the development of a collective space representing actors’ common conceptual ground. This space is likely to be created

through the sharing of stories, experiences, and mental models (Nonaka & Takeuchi, 1995; Tsoukas, in press); thus, mutual knowledge access in a work group is likely to facilitate the creation of this context. Once created, this context is likely to aid groups in forging new cognitive connections and developing novel insights through the integration of existing knowledge and novel knowledge introduced through exchange, which is likely to occur based on group members' increased abilities (e.g., conceptual expansion through analogy requires shared mental models (Nonaka & Takeuchi, 1995) and an understanding of others' knowledge sets (Un & Cuervo-Cazurra (2004)); motivation (e.g., recognition of value in potential knowledge exchange requires prior related knowledge (Cohen & Levinthal, 1990)); and opportunities (e.g., the more potential parties there are to exchange, the greater the likelihood that productive exchange opportunities will exist and come to light (Moran & Ghoshal, 1999)) to collectively engage in back-and-forth knowledge transfer.

I expect work groups' access to external knowledge to inform the conceptual expansion process that occurs within the group during knowledge creation, leading to a greater likelihood that new knowledge with relevance and value for the entire organization is created (Un & Cuervo-Cazurra, 2004). Specifically, while a shared cognitive space within a work group is important in bridging new and existing concepts, access to knowledge outside of the group can provide a greater variety of information (Smith et al., 2005) and more diverse ideas (Ancona & Caldwell, 1992) on which a group can draw in its internal integration efforts (Oh et al., 2004) – likely leading to greater innovativeness in the new knowledge that is ultimately created.

The implementation of new ideas requires that a work group recognize the value of those ideas prior to witnessing success associated with their use in the relevant context. A work group's access to knowledge is likely to impact its implementation decisions at two stages. First, group knowledge access determines the

new ideas which come to light for review (i.e., groups can only evaluate the potential of the knowledge to which they have access). In this stage, access to knowledge plays a single, straightforward role as a new idea filter.

Second, a group's access to knowledge is likely to affect the process of idea evaluation and subsequent implementation decision. Specifically, extending Cohen and Levinthal's (1990) concept of absorptive capacity to the work group level, I expect that the extent of a group's access to abundant and diverse knowledge will affect the group's ability to recognize value in, assimilate, and apply new knowledge to worthwhile ends. First, the greater the amount and the diversity of the knowledge accessible to a group, the more likely it is that, when new ideas come to light, the group will have been exposed to knowledge in a related area (Cohen & Levinthal, 1990). Because it is easier to identify practical uses for and thus recognize value in abstract ideas when they are in familiar domains (Shane, 2000), abundance and diversity in groups' accessible knowledge is likely to increase the likelihood of new idea implementation. Second, a group's knowledge access represents not a dormant stock of knowledge available for the group's use but a set of exchange channels connecting the group's members to a variety of other actors within the group, in other parts of the organization, and in the external environment. Thus, to the extent that these channels provide group members with access to actors with diverse ideas and expertise, the work group is likely to engage in productive debate resulting in recognition of value and potential for practical use in more ideas, thus increasing the likelihood of implementation further (De Dreu & West, 2001).

*Hypothesis 8: Work groups' access to knowledge will be positively related to innovativeness.*

#### **Access to Tangible Resources and Work Group Adaptability and Innovativeness**

It is generally accepted among scholars that an abundance – or at least

sufficiency – of tangible resources is necessary for adaptation and innovation activities in organizations (Nohria & Gulati, 1996). Specifically, abundance in tangible resources provides firms more freedom for exploration by allowing organizations to absorb losses associated with unsuccessful endeavors (March, 1991) and thus often promotes norms of experimentation (Bourgeois, 1981) and tolerance of uncertainty (Levinthal & March, 1993) – important prerequisites for many innovation- and adaptation-oriented activities (Garcia, Calantone, & Levine, 2003). In contrast, firms lacking in tangible resources often focus efforts on improving efficiency and control in order to conserve resources and minimize potential losses (March 1991).

However, while tangible resource access is important in allowing for explorative search in adaptation and innovation processes, it is only likely to contribute to a work group's *innovativeness* and *adaptability* to the extent that it complements the group's access to knowledge. Specifically, in the absence of knowledge access, explorative search enabled by tangible resource access is unlikely to result in valuable idea generation or adaptive response to change. On the other hand, when a work group has high levels of access to knowledge, access to tangible resources is likely to allow for more extensive search for information and available alternatives (Garcia et al., 2003; March, 2001), greater ease in implementing new ideas, and more time for feedback-based learning (Burke et al., 2006).

*Hypothesis 9: Access to tangible resources will moderate the relationship between access to knowledge and adaptability such that the positive relationship between access to knowledge and adaptability will be stronger in the presence of greater access to tangible resources.*

*Hypothesis 10: Access to tangible resources will moderate the relationship between access to knowledge and innovativeness such that the positive relationship between access to knowledge and innovativeness will be stronger in the presence of greater access to tangible resources.*

## **METHOD**

### **Sample and Research Procedures**

Data were collected from work groups composed of professional employees in an environmental science and engineering division of a hydroelectricity firm. This division's primary responsibilities include the design and long-term maintenance of infrastructure for the generation and transport of hydropower. For example, common projects assigned in this division involve technological upgrades of current infrastructure, design of dam systems with special consideration of environmental safety and preservation, and new power plant and power grid design for increased efficiency. The division is structured such that individual managers are responsible for the management of each work group with a fair amount of discretion in the HR practices that they employ. While a corporate HR function does exist, its primary role is to provide support and loose guidance to work group managers, thus allowing for significant variance in the use of HR practices across managers and work groups throughout the division.

For each of the 68 work groups in the sample, data came from two sources: a) detailed surveys completed by the employees in a work group (to assess the work group's social climate, social ties, and access to knowledge and tangible resources); and b) a detailed survey completed by the manager of the work group (to assess HR practices, group adaptability, and group innovativeness). The average within-group response rate for employees was 48 percent, and all work groups had at least four employees.

## **Variable Definitions and Measurement**

***Social capital-enhancing HR practices.*** Because different types of HR practices may be required to elicit a supportive group social climate and promote employees' network ties external to their work group, I examined two bundles of HR practices which aim to support these different types of social capital. In particular, based on a review of the literature and my theoretical development leading to Hypotheses 1a-c, I assessed a set of six climate-enhancing HR practices and a set of six network-enhancing HR practices, which I expected to contribute to the development of work groups' social climates and external network ties, respectively. For each practice, I asked work group managers to indicate on a five point scale (where 1 = "strongly disagree" and 5 = "strongly agree") the extent to which they employed the practice in managing their work group. I then computed the mean score for the six practices in each bundle to create two HR practice indices. The use of an additive index is consistent both with previous SHRM research (e.g., MacDuffie, 1995; Youndt et al., 1996) and with my conceptual arguments regarding the additive nature of the effects of individual HR practices (Delery, 1998). In particular, I expect that each of the HR practices included in a bundle will uniquely contribute to the overarching aims of that bundle (e.g., supportive group social climate, ties to actors external to the work group). The appendix provides the specific items included in each HR practice bundle.

***Work group social climate.*** I measured group social climate using employee surveys. For each set of items below, employees in each work group were asked to assess the extent to which they agreed (where 1 = "strongly disagree" and 5 = "strongly agree") with each statement with regard to the climate of their work group. The scales used to assess each dimension of group social climate are provided in the appendix.



**Cooperation.** To assess climate for cooperation, I adapted five items from Collins and Smith's (2006) measure of the same variable. Sample items include "Employees in this group expect full cooperation from each other when it comes to work" and "Employees in this group often feel that they are competing against each other" (reverse coded). The scale demonstrated good internal consistency ( $\alpha = .81$ ), providing support for combining the five items into a single measure. However, ICCs associated with cooperation —  $ICC(1) = .12$ ,  $ICC(2) = .44$  — were low by conventional standards. Low  $ICC(2)$  values can lead to difficulty in detecting emergent relationships using group means. However, because I theoretically defined and empirically assessed cooperation as a group level construct and variable, respectively, I continued with my analyses and the aggregation of this variable as planned (Chen and Bliese, 2002).

**Trust.** To measure climate for trust, I adapted Mayer and Davis's (1999) measure into a ten-point scale. I ensured that this adaptation assessed ability, benevolence, and integrity – the three dimensions of trust outlined by Mayer, Davis, and Schoorman (1995). Specifically, ability items assess the extent to which employees believe that fellow group members are capable (e.g., "Employees in this group have extensive knowledge about the work that they need to do"). Benevolence items assess the extent to which employees believe that fellow group members seek to act in one another's best interests (e.g., "Employees in this group really look out for what is important to the other members of the group"). Finally, integrity items assess employees' perceptions that fellow group members treat one another fairly (e.g., "Employees in this group try hard to be fair in dealings with other group members"). The scale showed good internal consistency ( $\alpha = .93$ ). Again, ICC levels —  $ICC(1) = .10$ ,  $ICC(2) = .39$  — were below conventional norms, but I proceeded with planned aggregation based on the logic noted above.

**Shared language.** To assess the existence and use of shared language, I adapted four items created by Collins and Smith (2006) based on theoretical guidance from Nahapiet and Ghoshal (1998). A sample item was “Employees in this group always understand one another when they talk about work.” One item in the shared language scale was reverse-coded and failed to load well with the other items. Thus, I dropped this item, such that the final shared language scale had three items and adequate internal consistency ( $\alpha = .75$ ). I again aggregated individual responses on this scale despite low ICCs (i.e.,  $ICC(1) = .05$ ,  $ICC(2) = .23$ ).

**Productive task conflict.** I set out to assess work groups’ task conflict using a five-item adaptation of Jehn’s (1995) task conflict measure. Specifically, this adaptation includes reframed versions of Jehn’s neutral task conflict items (e.g., “Employees in this group often disagree about opinions regarding the work being done”) as well as additional items assessing the positivity around task conflict within the group (e.g., “Even when we don’t agree about how to accomplish a task, members of this group enjoy debating the principles of the problem at hand”). However, the two items assessing positivity failed to load well with the three neutral items from Jehn’s original scale, so I dropped these two items from the scale. The three neutral task conflict items combined to form a scale with moderate internal consistency ( $\alpha = .70$ ) and low ICC levels (i.e.,  $ICC(1) = .06$ ,  $ICC(2) = .27$ ).

**Network ties.** To assess the characteristics of group members’ network ties, I created a list of functional categories in which employees may have ties outside of their work group (either within or outside of the organization). I consulted my contacts at the organization in creating this list to ensure the appropriateness of the categories for the employees in this sample. While my original hypotheses called for two lists based on the separation of ties held with other employees in the organization (i.e., internal ties) and those held with actors outside of the organization (i.e., external

ties), in these conversations it became evident that, due to the structure of this organization, it made more sense to combine these tie categories into a list of total tie categories external to the group (both within and outside the larger organization). Thus, all hypotheses involving characteristics of internal and external ties were tested using the combined list of tie variables. Based on this list, I use Smith et al.'s (2005) measures of tie number, strength, and range, requesting that employees assess these characteristics of their ties in each category listed. A list of all tie categories, as well as all survey items assessing network tie characteristics, are provided in the appendix.

***Number of ties.*** To assess tie number, I asked employees to report how many direct contacts they had in each of twelve functional categories (e.g., production/operations, government agencies) outside of their work group. I then computed the sum of contacts across these categories to assess the total number of contacts for each employee. I then computed the mean number of ties held by employees in each work group to reach an aggregated assessment at the group level.

***Range of ties.*** Tie range was computed at the work group level as the proportion of categories in which a work group reports at least one tie partner. For example, if out of the twelve possible functional categories, the members of a work group collectively have ties to actors in six of those categories, the group would receive a score of 0.5 on external tie range.

***Strength of ties.*** The strength of a tie is a function of the duration of the relationship, the frequency of interaction, and the emotional closeness between two contacts (Granovetter, 1973). I assessed relationship duration by asking employees to report the average length of time they have been connected with their tie partners in each functional category. Frequency of interaction was measured as the average number of times per month that an employee communicates with his ties in each functional category. Emotional closeness was assessed using a five point scale which

asked employees how close they are, on average, with their contacts in each functional category. Average tie strength was computed at the work group level by standardizing and then summing the scores of these three relational components for all of the ties held by employees in a work group.

***Access to knowledge.*** Because I was interested in work groups' abilities to access knowledge in each of the environmental spaces in which they operate, I asked employees about their access to knowledge existing within the work group itself (i.e., held by individual members of the work group), in other parts of the organization, and external to the organization. Access to knowledge requires not only that knowledge is available, but also that a work group a) is aware of the existence and location of the knowledge; b) has an open exchange relationship with the source or controller of the knowledge; and c) has the ability to acquire the knowledge without significant complication or difficulty. Thus, I attempted to capture these three criteria for knowledge access in each location (e.g. "Employees in this group can easily find required information in other parts of [this company] that they need to complete their work;" "Employees in this group are willing to exchange and combine ideas with each other;" and "It is easy for this group to acquire knowledge that it does not already possess from outside of [this company]."). Because the proposed items were created for an original scale, I conducted a confirmatory factor analysis on all access to knowledge and access to tangible resources (see below) items to verify scale validity. The results of this analysis indicated that the access to knowledge items were most appropriately combined into two scales: access to knowledge within the work group (3 items) and access to knowledge outside the work group (6 items) and that access to tangible resource items best loaded on a separate construct from the knowledge access items. Specifically, fit statistics for a three factor model (i.e. one tangible resource access factor, one external knowledge factor, one group knowledge factor: chi-squared

= 61.26 (df = 48), AIC = 121.26, CFI = 0.98, RMSEA = .06) indicated significantly better fit than fit statistics for a two factor model (i.e. chi-squared = 69.21 (df = 47), AIC = 131.21, CFI = 0.97, RMSEA = .08). Following the confirmatory factor analysis, an internal consistency check reflected good reliability for both access to knowledge scales (i.e.,  $\alpha = .94$  for access to knowledge within the work group and  $\alpha = .91$  for access to knowledge outside the work group). Thus, I proceeded with analyses based on two knowledge access variables: access to group knowledge and access to external knowledge. ICCs for access to group knowledge were fair (ICC(1) = .18, ICC(2) = .56), while ICCs for access to external knowledge were lower (ICC(1) = .11, ICC(2) = .42). A complete list of items and the two access to knowledge scales appear in the appendix.

***Access to tangible resources.*** To measure work groups' access to tangible resources, I created a four-item scale assessing the comfort of the group in requesting tangible resources from other parts of the organization, the ease with which the group is able to obtain needed tangible resources, and the sufficiency of the group's current tangible resource position. Based on the confirmatory factor analysis mentioned above, I eliminated one item from the scale due to its low factor loading, resulting in a final scale of three items with good internal consistency ( $\alpha = .85$ ). Once again, I aggregated employees' responses to the work group level despite low ICC levels for this measure (i.e., ICC(1) = .09, ICC(2) = .35). The exact items included in the scale appear in the appendix.

***Adaptability.*** While adaptability in organizational contexts has been given increasing research attention in recent years, I could not find a measure for this construct. In contrast, measures of team adaptation (Burke et al., 2006), organizational actions in response to opportunities and threats (Chattopadhyay et al., 2001), individual and team adaptive performance (Han & Williams, 2008), and

adaptive job performance (Pulakos et al, 2000) have been modeled in recent studies. However, given my conceptualization of and focus on adaptability as a group capability as opposed to a performance outcome, measures used in these studies were inappropriate for the present investigation. Thus, I developed eleven adaptability items based on the definition of the construct set out in this article and reflective of capabilities required for the behaviors outlined in Pulakos et al.'s (2000) "Dealing with uncertain and unpredictable work situations" dimension of adaptive performance, with the addition of a requirement for efficiency in performing specified behaviors. I asked work group managers to rate their work groups on each of these eleven items. I then conducted a confirmatory factor analysis on the eleven adaptability items and the five innovativeness items noted below to ensure scale validity. The factor analysis indicated that two scales (i.e., one for adaptability and one for innovativeness) better fit the data (chi-squared = 77.67 (df = 60), AIC = 165.67, CFI = 0.96, RMSEA = .07) than a single scale with all adaptability and innovativeness items combined (chi-squared = 165.84 (df = 61), AIC = 251.84, CFI = 0.75, RMSEA = .16). Following the elimination of two items with poor factor loadings from the adaptability factor, the final adaptability scale contained nine items and demonstrated good internal consistency ( $\alpha = .87$ ). The full set of items appears in the appendix.

***Innovativeness.*** To assess work group innovativeness, I asked work group managers to rate their work groups on a scale of one to five on five items in a group innovativeness scale adapted from the scale of firm-level innovativeness used by Calantone et al. (2002) (excluding the final item from the original six-item scale based on lack of contextual relevance). I eliminated one additional item from the scale due to a poor factor loading in the confirmatory factor analysis noted above, resulting in a final innovativeness scale with four items and good internal consistency ( $\alpha = .85$ ). The exact items included in the measure appear in the appendix.

***Control variables.*** In addition to the variables in the proposed model, I included the following control variables in all regression analyses: organizational tenure, education, proportion of specialists in work group, and proportion of union employees in work group. I included the last two control variables because employees in these last two job classes may be characterized by unique traits which could impact their relationships and exchanges both with other group members and actors external to the group.

## ANALYSES AND RESULTS

Table 1 displays means, standard deviations, and correlations for all variables. As illustrated in this table, many variables did not correlate with one another in the expected directions and/or with the expected levels of significance. However, because these correlations do not account for the effects of controls and other predictors, I proceeded with the planned regression analyses to test my hypotheses.

### **Hypotheses 1a, b, and c: HR Practices and Work Group Social Climate and Ties**

Tables 2 and 3 report the results of regression analyses predicting social climate and social ties, respectively. As shown in models 2, 4, and 6 of Table 2, climate-enhancing HR practices were significantly positively related to work groups' climates for trust ( $\beta = 0.42, p < 0.05$ ), cooperation ( $\beta = 0.55, p < 0.01$ ), and use of shared language ( $\beta = 0.39, p < 0.05$ ), respectively, but were not predictive of conflict (as indicated in model 8 of the same table). Thus, Hypothesis 1a, which predicted positive relationships between these HR practices and the four climate dimensions examined, was partially supported. Additionally, while not hypothesized, the results in model 4 indicate a significant negative relationship between network-enhancing HR practices and cooperation ( $\beta = -0.42, p < 0.05$ ).

Models 2, 4, and 6 in Table 3 display results of regression analyses predicting number of ties, tie range, and tie strength, respectively. As can be seen in these

Table 1  
Correlations, Means, and Standard Deviations<sup>a</sup>

	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Adaptability	3.80	0.41	(0.87)												
2. Innovativeness	3.37	0.62	0.39**	(0.85)											
3. Group Knowledge	3.94	0.47	0.03	0.01	(0.94)										
4. External Knowledge	3.31	0.41	0.07	-0.15	0.43**	(0.91)									
5. Tangible Resources	3.58	0.44	0.07	-0.07	0.56**	0.57**	(0.85)								
6. Tie Number	45.04	32.1	-0.02	0.06	0.04	0.23†	0.14								
7. Tie Range	0.70	0.19	0.02	-0.10	-0.04	0.31**	0.16	0.34**							
8. Tie Strength	-0.17	1.36	0.10	0.09	-0.14	0.19	0.17	0.44**	0.13						
9. Trust	3.73	0.37	-0.05	-0.12	0.77**	0.46**	0.47**	0.11	0.02	-0.03	(0.93)				
10. Cooperation	3.60	0.35	0.04	-0.04	0.63**	0.39**	0.38**	0.07	0.00	-0.04	0.80**	(0.81)			
11. Shared Language	3.64	0.36	-0.03	0.08	0.24*	0.20†	0.18	0.30**	0.19	-0.10	0.42**	0.51**	(0.75)		
12. Conflict	2.64	0.36	0.07	-0.01	-0.33**	-0.15	-0.30**	-0.09	-0.14	0.19	-0.32**	-0.42**	-0.57**	(0.70)	
13. Network HR Practices	3.20	0.51	0.24*	0.14	0.05	0.16	0.08	0.09	0.09	0.27*	0.00	-0.04	0.02	-0.01	
14. Climate HR Practices	3.33	0.46	0.19	0.11	0.11	0.24*	0.05	0.03	0.01	0.08	0.19	0.21†	0.18	-0.09	0.70**
15. Unit Size	17.00	19.5	0.17	-0.09	-0.05	0.04	0.09	-0.02	0.37**	0.05	-0.10	-0.06	-0.11	-0.03	0.05
16. Organizational Tenure	11.13	5.58	0.01	0.05	-0.10	0.20†	0.06	0.21†	0.03	0.42**	-0.07	-0.09	0.03	0.11	0.06
17. Education	6.17	1.66	-0.21†	-0.13	-0.03	-0.07	-0.20†	-0.04	0.05	-0.16	0.13	-0.10	0.17	0.02	-0.30**
18. % Specialists	0.32	0.33	0.12	0.10	-0.30**	-0.27*	-0.37**	0.06	-0.04	0.01	-0.23†	-0.03	-0.04	0.08	0.10
19. % Union employees	0.04	0.16	0.11	-0.05	-0.06	0.00	0.13	-0.03	0.30*	0.00	-0.11	-0.10	-0.11	-0.03	0.08

<sup>a</sup> Scale reliabilities are reported on the diagonal.

†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$



Table 1 (Continued)<sup>a</sup>

14	15	16	17	18
0.07				
0.01	-0.19			
-0.24*	-0.16	-0.10		
0.06	-0.03	-0.03	-0.04	
0.19	0.70**	-0.31**	-0.25*	-0.1

<sup>a</sup> Scale reliabilities are reported on the diagonal.  
†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$

models, network-enhancing HR practices were related only to tie strength ( $\beta = 0.34, p < 0.05$ ) (although the overall F-change was not significant), providing partial support for Hypotheses 1b and c, which predicted positive relationships between network-enhancing HR practices and these tie characteristics.

#### **Hypotheses 2 through 4: Social Climate and Ties and Access to Knowledge**

Hypotheses 2 through 4 predicted that the characteristics of work groups' social climates and social ties would relate to access to knowledge. Table 4 reports results of regression analyses predicting access to group knowledge and access to external knowledge. As shown in model 3 of this table, trust was the only climate dimension which was positively related to access to group knowledge ( $\beta = 0.71, p < 0.01$ ), indicating partial support for Hypothesis 2, which focused on the role of work group climate in predicting knowledge access. Interestingly, network-enhancing HR practices displayed a marginally significant positive relationship ( $\beta = 0.24, p < 0.10$ ) and tie strength displayed a marginally significant negative relationship ( $\beta = -0.16, p < 0.16$ ) with access to group knowledge as well.

In running initial regressions to assess Hypotheses 3 and 4, which linked social tie characteristics to external knowledge access, none of the tie characteristics was predictive of access to external knowledge. Based on these results and the similarity in theoretical rationale for number of ties and tie range as predictors, I dropped number of ties as a predictor variable from subsequent analyses. I chose to eliminate number of ties as opposed to tie range because diversity in relationships seemed more likely to yield access to abundant, non-redundant knowledge than number of ties alone. Model 6 of Table 4 displays results of the regression analysis conducted to assess Hypotheses 3 and 4. As can be seen in this model, tie range was significantly positively related to access to external knowledge ( $\beta = 0.30, p < 0.05$ ), while tie strength was not – providing partial support for Hypotheses 3 and 4.

Table 2  
Results of Regression Analyses Predicting Social Climate<sup>a</sup>

	Trust	Trust	Cooperation	Cooperation	Shared Language	Shared Language	Conflict	Conflict
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Unit Size <sup>b</sup>	-0.1	-0.01	0.05	0.16	-0.03	0.05	-0.01	-0.05
Organizational Tenure	-0.16	-0.19	-0.18	-0.20	0.14	0.12	0.00	0.01
Education	0.05	0.08	-0.17	-0.18	0.18	0.20	0.02	0.02
% Specialists	-.23†	-0.23†	-0.04	-0.02	-0.05	-0.05	0.07	0.07
% Union Employees	-0.11	-0.23	-0.24	-0.37*	-0.01	-0.11	-0.01	0.03
Climate-enhancing HR practices		0.42*		0.55**		0.39*		-0.18
Network-enhancing HR practices		-0.21		-0.42*		-0.20		0.11
$\Delta R^2$	0.10	0.09	0.05	0.15	0.05	0.08	0.01	0.01
$\Delta F$	1.45	3.30*	0.72	5.42**	0.71	2.59†	0.09	0.46
Total $R^2$	0.10	0.19	0.05	0.20	0.05	0.13	0.01	0.02

<sup>a</sup> Standardized coefficients are reported.

<sup>b</sup> logarithm

†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$

Table 3  
Results of Regression Analyses Predicting Tie Number, Range, and Strength<sup>a</sup>

	Number of Ties	Number of Ties	Tie Range	Tie Range	Tie Strength	Tie Strength
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Unit Size <sup>b</sup>	0.29†	0.31†	0.42**	0.41**	0.22	0.2
Organizational Tenure	0.19	0.17	0.12	0.11	0.35**	0.33*
Education	0.05	0.07	0.18	0.21†	-0.08	-0.02
% Specialists	-0.01	-0.02	0.01	0	0.01	-0.01
% Union Employees	-0.08	-0.11	0.14	0.15	-0.02	0.00
Climate-enhancing HR practices		0.08		-0.09		-0.18
Network-enhancing HR practices		0.05		0.19		0.34*
$\Delta R^2$	0.09	0.01	0.24	0.02	0.17	0.06
$\Delta F$	1.30	0.41	3.92**	0.76	2.59*	2.26
Total $R^2$	0.09	0.10	0.24	0.26	0.17	0.23

<sup>a</sup> Standardized coefficients are reported.

<sup>b</sup> logarithm

†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$

Table 4  
Results of Regression Analyses Predicting Access to Knowledge<sup>a</sup>

	Group Knowledge	Group Knowledge	Group Knowledge	External Knowledge	External Knowledge	External Knowledge
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Unit Size <sup>b</sup>	-0.09	-0.05	-0.01	0.15	0.22	0.07
Organizational Tenure	-0.18	-0.2	0.04	0.17	0.14	0.19
Education	-0.11	-0.08	-0.07	-0.05	0.00	-0.04
% Specialists	-0.31**	-0.32**	-0.15†	-0.27*	-0.28*	-0.20†
% Union Employees	-0.12	-0.17	0.04	-0.06	-0.15	-0.08
Climate-enhancing HR practices		0.16	-0.20		0.30†	0.17
Network-enhancing HR practices		-0.01	0.24†		-0.03	0.00
Trust			0.71**			0.33
Cooperation			0.14			0.16
Shared Language			-0.17			-0.12
Conflict			-0.11			0.01
Tie Strength			-0.16†			0.06
Tie Range			-0.05			0.30*
$\Delta R^2$	0.14	0.02	0.53			
$\Delta F$	2.00†	0.76	15.78**	1.81	2.67†	3.82**
Total $R^2$	0.14	0.16	0.69	0.13	0.2	0.23

<sup>a</sup> Standardized coefficients are reported.

<sup>b</sup> logarithm

†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$

### **Hypotheses 5 and 6: Social Ties and Access to Tangible Resources**

Hypotheses 5 and 6 predicted that the characteristics of work groups' social ties would be positively related to access to tangible resources. Model 3 of Table 5 reports relevant regression results and indicates no support for these hypotheses. However, as demonstrated in this table, while not hypothesized, a positive relationship between trust and access to tangible resources ( $\beta = 0.47, p < 0.05$ ) is demonstrated in these results.

### **Hypotheses 7 through 10: Access to Knowledge and Tangible Resources and Innovativeness and Adaptability**

Hypotheses 7 through 10 focused on the roles of access to knowledge and access to tangible resources in work groups' innovativeness and adaptability. Results of regression analyses predicting innovativeness are displayed in Table 6, and results of regression analyses predicting adaptability are provided in Table 7.

Hypothesis 7 predicted that work groups' access to knowledge would be positively related to innovativeness. Model 4 of Table 6 reports relevant regression results and indicates that access to group knowledge demonstrated a marginally significant positive relationship with innovativeness ( $\beta = 0.43, p < 0.10$ ). However, the F-test for the overall model was not significant, indicating a lack of support for Hypothesis 7.

Model 4 of Table 7 reports regression results relevant to the assessment of Hypothesis 8, which predicted that access to knowledge would be positively related to adaptability. As shown in this model, the results provide no support for this hypothesis. In addition to considering main effects in assessing Hypotheses 7 and 8, because access to knowledge was separated into two variables, I included an interaction term computed as the product of the two knowledge access variables in model 5 of Tables 6 and 7; however, this term was not significant in either regression. Hypotheses 9 and 10 predicted that access to knowledge and access to tangible

Table 5  
Results of Regression Analyses Predicting Access to Tangible Resources<sup>a</sup>

	Model 1	Model 2	Model 3
Unit Size <sup>b</sup>	0.02	0.02	-0.04
Organizational Tenure	0.05	0.05	0.09*
Education	-0.19	-0.17	-0.21
% Specialists	-0.37**	-0.38**	-0.26*
% Union Employees	0.07	0.07	0.17
Climate-enhancing HR practices		-0.04	-0.21
Network-enhancing HR practices		0.08	0.12
Trust			0.47*
Cooperation			0.00
Shared Language			-0.06
Conflict			-0.19
Tie Strength			0.13
Tie Range			0.07
$\Delta R^2$	0.19	0	0.27
$\Delta F$	2.93*	0.11	4.53**
Total $R^2$	0.19	0.19	0.46

<sup>a</sup>Standardized coefficients are reported.

<sup>b</sup> logarithm

†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$

Table 6  
Results of Regression Analyses Predicting Adaptability<sup>a</sup>



	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Unit Size <sup>b</sup>	0.28†	0.31*	0.34†	0.35†	0.36†	0.38†	0.35†
Organizational Tenure	0.01	-0.02	0.01	0.00	-0.02	-0.01	0.00
Education	-0.18	-0.12	-0.08	-0.05	-0.04	-0.04	-0.05
% Specialists	0.13	0.11	0.09	0.14	0.14	0.12	0.13
% Union Employees	-0.09	-0.13	-0.08	-0.10	-0.12	-0.16	-0.11
Climate-enhancing HR practices		0.08	0.03	0.09	0.10	0.16	0.10
Network-enhancing HR practices		0.14	0.21	0.16	0.14	0.07	0.15
Trust			-0.06	-0.23	-0.29	-0.32	-0.24
Cooperation			0.12	0.00	0.12	0.09	0.10
Shared Language			0.04	0.07	0.07	0.09	0.08
Conflict			0.12	0.15	0.16	0.16	0.17
Tie Strength			-0.03	-0.02	0.00	-0.01	0.00
Tie Range			-0.11	-0.11	-0.12	-0.17	-0.11
Access to Group Knowledge				0.18	0.16	0.10	0.16
Access to External Knowledge				0.00	0.01	-0.03	-0.01
Access to Tangible Resources				0.09	0.08	0.09	0.09
Group Knowledge*External Knowledge					-0.11		
Group Knowledge*Tangible Resources						-0.30*	
External Knowledge*Tangible Resources							-0.06
$\Delta R^2$	0.11	0.04	0.02	0.02	0.01	0.05	0.02
$\Delta F$	1.58	1.40	0.23	0.39	0.53	3.60†	0.13
Total $R^2$	0.11	0.15	0.17	0.19	0.20	0.24	0.19

<sup>a</sup> Standardized coefficients are reported.

<sup>b</sup> logarithm

†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$

Table 7  
Results of Regression Analyses Predicting Innovativeness<sup>a</sup>

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Unit Size <sup>b</sup>	0.06	0.08	0.13	0.15	0.12	0.12	0.14
Organizational Tenure	0.08	0.06	0.00	0.03	0.06	0.04	0.02
Education	-0.13	-0.10	-0.11	-0.10	-0.11	-0.10	-0.09
% Specialists	0.10	0.09	0.07	0.08	0.10	0.10	0.1
% Union Employees	-0.08	-0.11	-0.11	-0.14	-0.09	-0.08	-0.11
Climate-enhancing HR practices		0.05	0.05	0.16	0.12	0.10	0.14
Network-enhancing HR practices		0.07	0.07	-0.03	0.00	0.05	-0.01
Trust			-0.11	-0.32	-0.20	-0.25	-0.31
Cooperation			-0.07	-0.10	-0.15	-0.09	-0.11
Shared Language			0.21	0.25	0.26	0.24	0.23
Conflict			0.00	0.04	0.02	0.03	0.01
Tie Strength			0.06	0.15	0.12	0.14	0.12
Tie Range			-0.17	-0.08	-0.05	-0.02	-0.06
Access to Group Knowledge				0.43†	0.46†	0.50*	0.47†
Access to External Knowledge				-0.22	-0.23	-0.19	-0.19
Access to Tangible Resources				-0.04	-0.01	-0.04	-0.04
Group Knowledge*External Knowledge					0.25		
Group Knowledge*Tangible Resources						0.26	
External Knowledge*Tangible Resources							0.14
$\Delta R^2$	0.04	0.01	0.05	0.07	0.04	0.04	0.01
$\Delta F$	0.53	0.32	0.47	1.48	2.80	2.57	0.78
Total $R^2$	0.04	0.05	0.1	0.17	0.21	0.21	0.18

<sup>a</sup> Standardized coefficients are reported.

<sup>b</sup> logarithm

†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$

resources would interact in predicting innovativeness and adaptability, respectively. Again because access to knowledge was separated into two variables, I created two interaction terms to assess each of these hypotheses: one computed as the product of access to group knowledge and access to tangible resources and the other as the product of access to external knowledge and access to tangible resources. Models 6 and 7 in Tables 7 and 8 report the results of regression equations including these interaction terms. As shown in Table 6, neither interaction term was significant in the prediction of innovativeness, suggesting a lack of support for Hypothesis 9. As shown in Table 7, however, the interaction term based on the product of access to group knowledge and access to tangible resources was significantly related to adaptability. To explore the nature of this interaction, I employed the Johnson-Neyman technique to derive regions of significance for the conditional effect of access to tangible resources on adaptability. The Johnson-Neyman result indicated that the relationship between access to tangible resources and adaptability was marginally significant and positive when access to group knowledge was between its minimum (i.e., 2.33) and 3.13 (or 1.72 standard deviations below its mean). However, given that the noted challenges associated with a small sample size are likely to be exacerbated in attempting to detect significance in the context of interaction terms, I plotted the effect of tangible resource access on adaptability at different levels of access to group knowledge to better illustrate this relationship. This chart appears in Figure 2. The relationship illustrated in Figure 2 suggests that, when access to group knowledge is low, the effect of access to tangible resources is positive – suggesting the importance of tangible resource access for adaptability. However, the chart suggests that the benefits of tangible resource access not only disappear but actually reverse when group knowledge access is high, suggesting a substitution effect between access to group knowledge and access to tangible resources which is not consistent with the prediction set forth in Hypothesis

10. I will explore this relationship in greater depth in my discussion below.

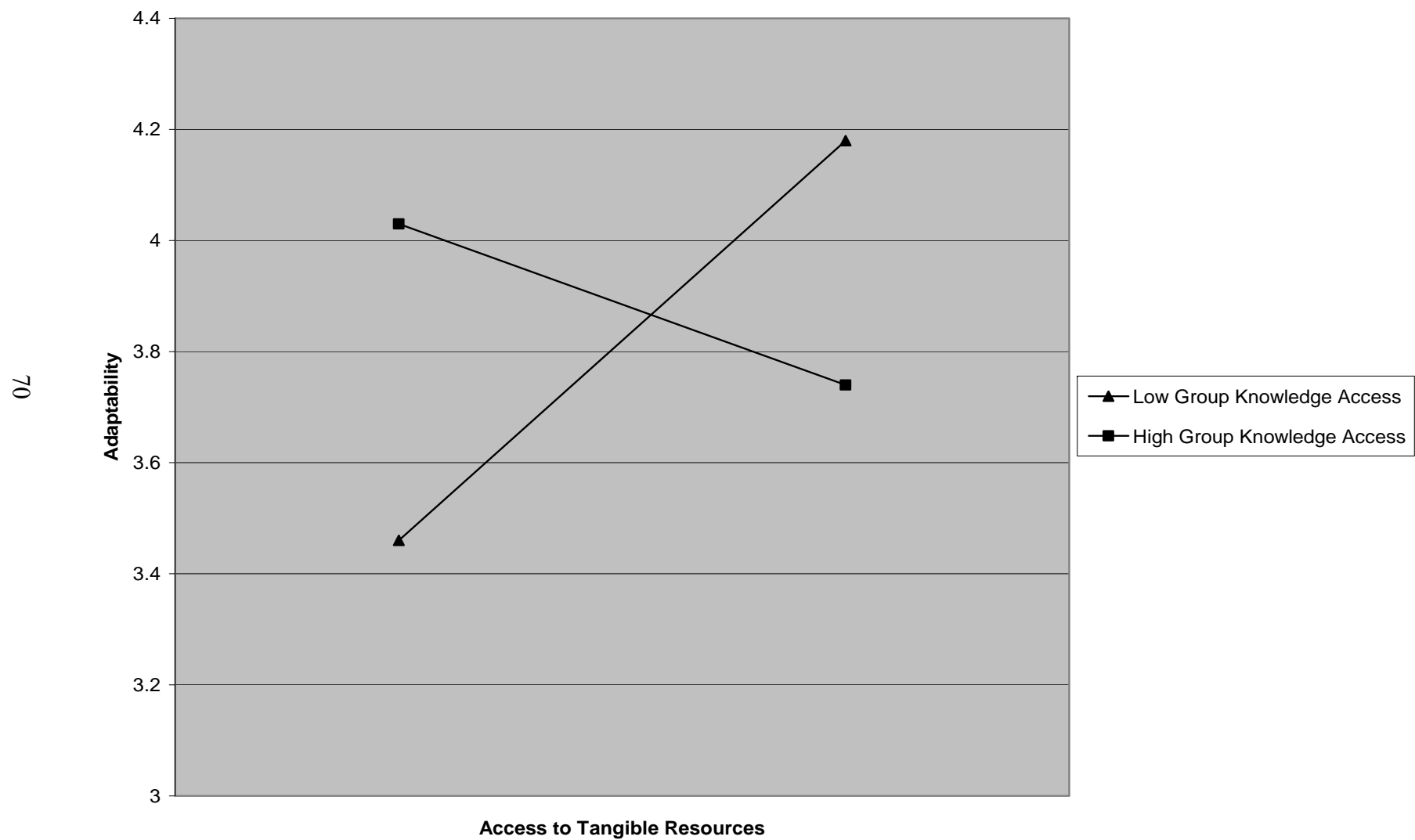
## **DISCUSSION**

For the present paper I had three overlapping goals: a) to propose and carry out an approach to the study of SHRM which breaks from and addresses some of the limitations of the best practice, high performance HR system tradition in this literature; b) to investigate how organizations can best manage their workforces to support the development of specific capabilities required for organizational renewal – namely innovativeness and adaptability; and c) to identify a set of HR practices which promote social capital development and maintenance in organizations. In pursuing these goals I developed and tested a model in which two bundles of social capital-enhancing HR practices (i.e., network-enhancing and climate-enhancing HR practices) predicted work groups' internal and external social capital, which contribute to work groups' access to knowledge and tangible resources, which ultimately predict work groups' innovativeness and adaptability. In the sections below, I discuss the results of my empirical analyses in the context of my proposed model as well as the broader literature and fields of practice to which they relate. I then consider some of the study's limitations and outline potential directions for future research in this area.

### **Findings with Respect to the Proposed Model**

Overall, regression analyses provided some support for my predicted model. The positive relationships between climate-enhancing HR practices and trust, cooperation, and shared language provide support for the notion that organizations can shape these dimensions of work groups' social climates by employing HR practices which provide employees the opportunities and incentives to engage with their colleagues in supportive, collaborative ways. These findings were consistent with my predictions and with the broader idea that targeted HR practices can aid in the development of employees' social capital.

Figure 2. Interaction between Access to Group Knowledge and Tangible Resources  
Predicting Adaptability



Additional support for the prediction that HR practices can support social capital development in work groups is seen in the significance of network-enhancing HR practices in predicting tie strength – a finding which suggests that organizations can help employees in building their social ties by providing training, feedback, funding, and social opportunities targeted for this purpose. Interestingly, network-enhancing HR practices were not predictive of the number or range of ties held by employees in a work group. While further empirical work in this area would be required to explain this finding, one possible explanation is that employees naturally form external relationships in the course of their work without the aid of targeted HR initiatives but that network-enhancing HR practices help employees to develop these relationships beyond the initial “arm’s length” level by providing opportunities for additional interaction and exchange. This idea is consistent with the significant coefficient ( $\beta = .33, p < 0.05$ ) on organizational tenure in the regression predicting tie strength (Table 3, Model 6), which suggests that, on average, the longer that the employees in a work group have worked for the organization (and thus the more opportunities they have likely had to interact with people they have met while on the job), the stronger their ties tend to be.

The relationships between social capital and access to knowledge were somewhat supportive of my predictions. Specifically, trust predicted access to group knowledge, which points to the importance of a benevolent and supportive group climate in fostering openness and willingness to seek and share knowledge with fellow work group members. This finding is promising from both a theoretical and practical standpoint in that, taken with the significance of climate-enhancing HR practices in predicting trust, it suggests a specific tool (i.e., climate-enhancing HR practices) that organizations can employ to ultimately enhance employees’ abilities to access the knowledge of their colleagues.



Tie range predicted access to external knowledge, pointing to the importance of employees' relationships with diverse types of people outside of their work group for the process of gaining access to unique knowledge in other locations. While consistent with my proposed model, this finding poses a challenge in light of the other empirical results in this study. In particular, the results suggest no tool or mechanism by which organizations can increase the range of employees' external ties – which I have shown to be critical in attaining access to knowledge outside of the work group. Further, while the results suggest that network-enhancing HR practices can aid in improving the strength of employees' external ties, tie strength does not seem to play a critical role in enabling access to external knowledge or tangible resources in this context.

While I initially predicted that tangible resource access would vary based on the nature of work groups' external ties (and by extension, groups' abilities to secure external support for their projects), I later learned that the terms of the organization's standard employment contract specify that employees will be provided equal access to tangible resources for their work. This is consistent with the finding that trust within the work group was the only significant predictor of access to tangible resources as within-group trust is likely to determine the extent to which employees are willing to contribute the resources that they have available to the broader goals of the group.

While the nature of the significant interaction between group knowledge and tangible resource access in predicting adaptability differed from the predicted interaction effect, this finding provided support for the role of both tangible and intangible resource access in groups' abilities to change and adapt when required. In particular, the substitution effect which emerged in this finding suggests that groups require access to tangible resources *or* knowledge in order to adapt when needed; however access to *both* these types of resources may be detrimental to adaptability.

One possible explanation for this finding is that groups with access to both tangible resources and group knowledge may become complacent in their superior resource positions such that they fail to see the need or urgency to adapt. On the other hand, groups who are aware that they are lacking access to one of these types of resources may achieve greater adaptability because they are more likely to leverage their access to the resource that *is* available to them in responding to environmental changes or uncertainty in an attempt to compensate for their lack of access to the other type of resource.

### **Internal vs. External Social Capital: Competing Forms?**

Some social capital scholars have warned that a potential risk of social capital development is the overembeddedness of individuals in relationships, which, among other things, can lead to a blockage of or lack of openness to new ideas or information (e.g., Adler & Kwon, 2000; Uzzi, 1997). In the context of internal and external social capital in work groups, the risk would be that investment in one of these forms of social capital would necessarily come at the expense of the other. In other words, stronger external relationships may make employees less willing to engage with other members of their own work group, whereas the development of a strong group climate could result in a group's closure to the external environment. Preliminary support for this notion emerged in the empirical results and suggests a need for further examination of this possibility in future work. Specifically, network-enhancing HR practices seem to have a negative effect on group social climates. While in the regressions predicting climate regressions network-enhancing HR practices only emerged as significant in predicting cooperation, the relationships between network-enhancing HR practices and trust and shared language are sufficiently large ( $\beta = -.21$  and  $\beta = -.20$ , respectively) that they would likely emerge as significant in a larger sample study. This pattern suggests that HR practices which encourage employees to

build social ties outside of their work groups may detract from time and attention which employees might otherwise devote to the within-group relationship development needed to facilitate a supportive group climate. Further support for this “competing” social capital hypothesis can be seen in the marginally significant negative effect of tie strength on access to group knowledge, which may suggest that employees in work groups who invest in strong relationships with external actors may be less willing, motivated, or able to access the knowledge existing within the boundaries of the group itself. Finally, based on these findings, I conducted an exploratory analysis to determine if additional support for this notion would emerge outside the formal hypothesis testing reported in the Results section. These analyses revealed a significant curvilinear relationship between access to group knowledge and innovativeness ( $\beta = -2.94, p < 0.05; R^2 = .27$ ), such that, up to a certain point, group knowledge access was positively related to innovativeness – after which point the benefits disappeared. While the explanation behind this result is not as clear-cut as the other examples provided above, this finding does suggest that some groups may experience “too much of a good thing” due to an over-reliance on internal knowledge in the context of innovativeness – which may be particularly likely if this reliance on group leads to a blockage of external information or ideas from the group’s consideration.

### **Contributions, Limitations, and Directions for Future Research**

From a theoretical perspective, this paper contributes to the SHRM literature by introducing two bundles of HR practices which can shape important, specific organizational outcomes. My findings demonstrate that climate-enhancing HR practices can help to shape group social climates so that they better support group members’ access to knowledge – which is critical to group innovativeness and adaptability – and tangible resources – which is important for adaptability.

Additionally, network-enhancing HR practices were shown to improve external tie strength, which, while not predictive of the outcomes examined in the present study, has been demonstrated to be important in other organizational contexts.

From a practical standpoint, my findings suggest a need for organizations to move beyond a best practice approach to human resource management and to instead focus on the HR practices which are most likely to improve the specific performance outcomes of interest given their particular context. One set of HR practices is not likely to drive all capabilities required for superior performance across all organizations. By first identifying the outcomes which are most important for success in an organization's present context, managers can tailor their management of employees to better support the capabilities required for those outcomes. In contexts where social capital is of value, climate-enhancing and network-enhancing HR practices are likely to serve as valuable mechanisms in the capability-building process.

As with all research, the present study must be considered in light of several limitations. First, the cross-sectional nature of the data precludes conclusions regarding causality. While a longitudinal research design would be required to overcome this challenge, in an attempt to provide some support for the model's predicted causal direction, I reran the final regressions to determine if in fact innovativeness and adaptability better predicted groups' access to knowledge and tangible resources than the reverse relationships depicted in the predicted model. Specifically, I included in these regression equations all control variables, both bundles of HR practices, and all climate and tie variables. None of these analyses yielded significant coefficients for innovativeness or adaptability or significant model F-statistics, providing some support for the order of variables proposed in my model.

A second limitation is that I tested my model using data collected in a single organization, which may raise concerns regarding the generalizability of the study's

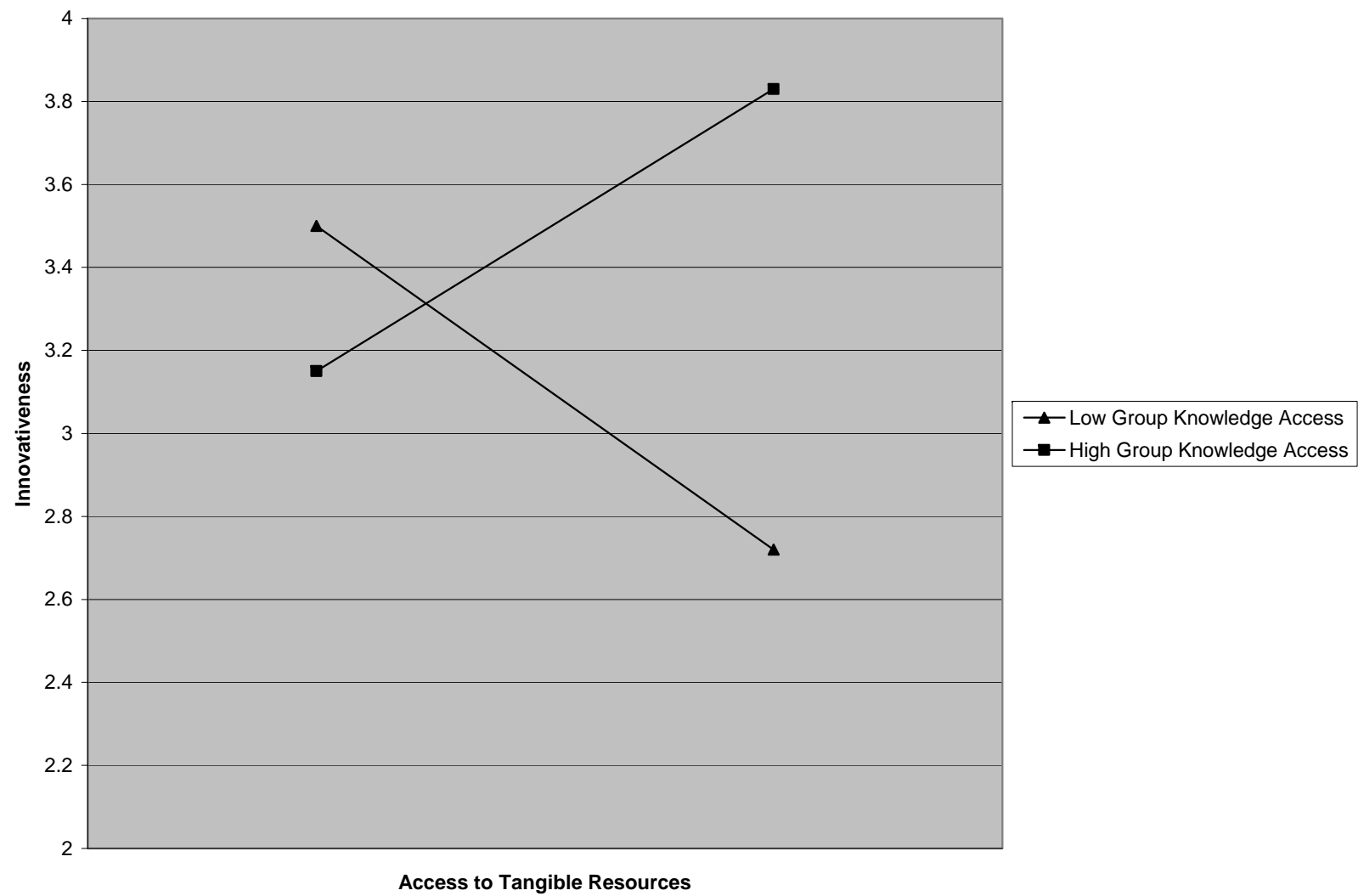
findings. Indeed, it is possible that the nature of relationships among variables in my model would differ in organizations with characteristics (e.g., organizational structures, cultures, task interdependencies, general and industry environments) which vary widely from those of the organization studied. For example, in the setting studied here, the divisional president consistently emphasized the importance of innovation for employees at all organizational levels; thus, it would be reasonable to expect stronger relationships in this context than in a setting in which innovation, change, and/or new ideas were not so highly valued or encouraged. However, several other aspects of the present organization are in fact likely to pose barriers to the emergence of the relationships predicted in my model, which may suggest that this organizational setting provides a conservative test of the model and which may even partially explain the lack of significance in some of the empirical results. For example, first, in the present organization, work is organized into projects which are assigned to temporary project teams within work groups. Projects vary in scope, completion time, task interdependencies, and required project team size, such that, depending on project assignment patterns across the organization and over time, employees both across and within work groups may experience vastly different levels of interaction and interdependence with fellow group members, leading to relatively low agreement on several group-level variables (e.g., shared language, conflict) and increased difficulty in detecting significant emergent relationships. Second, groups across this organization work on a wide variety of projects, with room for innovativeness and need for adaptability varying substantially such that groups whose tasks do not require or allow for innovative or adaptive performance may be rated low on these capabilities simply because they have not had the opportunity to demonstrate them. As a result, this organization may be an unfavorable setting for testing this portion of my theoretical model. On the other hand, work groups in organizations

where adaptability and innovativeness are required more consistently and can be demonstrated more regularly may be more fruitful grounds for testing relationships related to these capabilities.

An additional challenge related to the single-organization research context is that my examination of HR practices was limited to those practices that existed in this organization. As a result, certain potentially important social capital-enhancing practices (e.g., job rotation, formal cross-training mechanisms) were not included in my model.

Another limitation of this study is the small sample size, which reduced my power to detect smaller but potentially important effects. For example, in a larger-sample setting, it is likely that network-enhancing HR practices would have been a significant predictor of tie range ( $\beta = .19$ ) and that the interaction of access to group knowledge and access to tangible resources ( $\beta = .26$ ) would have been significant in predicting innovativeness as predicted. The small sample size may have been particularly problematic in this study given the complexity of the empirical model tested – a possibility supported by the results of exploratory analyses on a reduced model. Specifically, in a regression equation including only control variables, climate- and network-enhancing HR practices, access to group knowledge, external knowledge, and tangible resources, and an interaction between group knowledge and tangible resource access (i.e., dropping the climate and tie variables to reduce complexity), the interaction between group knowledge and tangible resource access was a significant predictor of innovativeness ( $\beta = .33, p < .05; R^2 = .14; \Delta F = 5.02^*$ ) in a pattern consistent with my predictions. Specifically, access to tangible resources interacted with access to group knowledge such that effect of tangible resource access was significant and positive only when access to group knowledge was high. A depiction of this relationship is provided in Figure 3.

Figure 3. Interaction between Access to Group Knowledge and Tangible Resources  
Predicting Innovativeness





Finally, I collected data for variables in the second and third stages of the model (i.e., climate, ties, access to knowledge, and access to tangible resources) from the same sources (i.e., employees), which may raise concerns about common source bias. While common source bias is a legitimate concern, the significant relationships between stage one (i.e. HR practices) and stage two (i.e., social capital) variables and between stage three and stage four variables (i.e., access to knowledge and innovation) which were collected from *different* sources (i.e., work group managers and employees) mitigate this concern substantially. Further, it would have been difficult to reliably measure the stage two or three variables from any other source, reflecting methodological support for this measurement approach as well.

Several promising directions for future research emerge from this study's theory, findings, and limitations. First, it would be useful for researchers to test this model in a variety of contexts and in organizations whose structures allow for a larger sample size. Such replications would allow for the detection of smaller effects and could help to determine the boundary conditions of the model. Second, future research would likely benefit from studies including one or more modifications to the current model. For example, changing the third stage of the model to more consistently reflect knowledge and tangible resource *exchange* (as opposed to mere access) may improve the model's success in predicting innovativeness and adaptability, as exchange is more proximal to these capabilities than is access. Indeed, there is a difference between *having access* to and *actually accessing* resources, such that groups could have access to resources without ever actually obtaining them for use.

Another potentially important model modification would be the inclusion of a variable reflecting motivation for innovativeness and/or adaptability. In its present form, the model indicates the role of ability and opportunity to innovate and/or adapt (i.e., reflected in access to knowledge and tangible resources) but does not account for

the importance of motivation in the emergence of either of these capabilities. Inclusion of a variable assessing motivation to innovate or adapt either at the work group or manager level could explain additional variance in these outcomes. A third direction for future research is the integration of the social capital perspective (considered in this paper) with other popular approaches in the SHRM literature. For example, a large body of work in the SHRM field focuses on the importance and development of human capital in organizations. A simultaneous consideration of human capital and social capital (and the interaction of these resources and the practices used to support them) in the context of innovativeness and adaptability would provide a more encompassing examination of renewal-oriented capabilities as they emerge and exist in organizations.

Another potential direction for future work would be a more developed operationalization of knowledge and tangible resources. Specifically, the importance of access to knowledge or tangible resources for innovativeness and adaptability may depend on the type of knowledge or resources that are available or needed. For example, it may be the case that work groups' innovativeness benefits most from *information* from external actors but from the exchange of *ideas* within the group.

Additionally, it would be useful to further explore both theoretically and empirically the nature of the relationships between access to tangible resources, access to knowledge, and innovativeness and adaptability. In particular, the results here suggest that knowledge and tangible resource access interact in different ways to predict innovativeness and adaptability, suggesting a need for further exploration in this area.

Finally, it would be useful for future research to examine the ways in which work group innovativeness and adaptability relate to higher level organizational outcomes. Relevant research questions here might concern how work groups'

renewal-oriented capabilities impact an organization's long-term renewal outcomes or how these capabilities relate to an organization's customer and market outcomes and financial performance over time.

Overall, this study contributes to research on strategic human resource management, social capital, and organizational renewal in several ways. First, I proposed two new bundles of HR practices aimed at eliciting two forms of social capital in work groups (i.e., supportive social climates and external ties), emphasizing an important new direction in SHRM research involving the consideration of different, targeted bundles of HR practices in supporting specific organizational capabilities and outcomes. Second, and relatedly, I identified management approaches (i.e., climate- and network-enhancing HR practices) which can be used by organizations to facilitate the conditions necessary for employees to access knowledge and tangible resources needed in their work. While previous research has pointed to social capital as a necessary condition for knowledge access in organizational contexts, this literature has tended to stop short of identifying mechanisms which can be used in facilitating needed social capital development. Finally, this paper suggests a variety of fruitful directions for future research, including the search for other HR practice bundles in the support of other organizational outcomes, additional inquiry into when different relationship characteristics (e.g., tie range, strength) are important for the exchange of tangible and intangible resources, and whether climate- and network-enhancing HR practices interact in meaningful ways with human capital-enhancing HR practices in the prediction of renewal-oriented capabilities and other performance outcomes in organizations over time.

## APPENDIX

### **Climate-enhancing HR Practices**

1. We select individuals for this group based on their overall fit with the group's values
2. Employees in this group keep a close eye on one another's work and effort.
3. Employees are expected to get the job done right the first time without oversight.
4. We regularly hold group-wide meetings to share information about progress with the project.
5. Bonuses are closely linked to the performance of the group rather than individual performance.
6. The compensation system for this group incorporates pay for skills/knowledge.

### **Network-enhancing HR Practices**

1. Employees in this group have received training to develop personal relationships with other employees in the firm.
2. Employees in this group are provided feedback on their ability to develop relationships with employees across different areas of the firm.
3. This group has employees from different departments or work groups in the firm.
4. We provide employees in this group extensive reimbursement for attending conferences and seminars.
5. We reimburse employees in this group for association memberships.
6. Strategies for developing personal relationships with key people external to the company have been discussed with this group.

### **Trust**

1. Employees in this group have a strong sense that they are treated fairly by other employees in this group.
2. Employees in this group try hard to be fair in dealings with other group members.
3. Sound principles seem to guide group members' behavior.
4. Employees in this group really look out for what is important to the other members of the group
5. The needs and desires of other group members are very important to the employees in this group.
6. Employees in this group will go out of their way to help each other with work.
7. The people in this group are very capable of completing their job.
8. Employees in this group feel confident about each other's skills.
9. Employees in this group have extensive knowledge about the work that they need to do. I am very confident in my own abilities to help this group accomplish its goals.

**Cooperation**

1. Employees in this group expect full cooperation from each other when it comes to work.
2. There are expectations in this group that employees will fully disclose critical information to one another.
3. Employees in this group often feel that they are competing against each other.
4. Employees in this group are supportive of each other when they make mistakes.
5. Employees in this group are open to criticism about their work.

**Shared language**

1. Employees in this group find it difficult to understand each other when working together on a project.
2. Employees in this group always understand one another when they talk about work.
3. Employees in this group have difficulty understanding the jargon used by other group members.

**Productive task conflict**

1. Employees in this group often disagree about opinions regarding the work being done.
2. There are frequently conflicts about ideas in this group.
3. Employees' opinions differ to a great extent in this work group.

**Internal and External Tie Categories**

- Universities and Research Institutions
- Suppliers
- Customers
- Government Agencies
- Trade Associations
- Other External Experts (e.g., consultants, marketing agencies)
- Within [Subunit A of division]
- Within [Subunit B of division]
- Other Internal Contacts

**[For each category in which the respondent has ties]:**

**Tie Number**

I have \_\_\_ total business or personal contacts in this category.

**Tie Strength**

1. On average, how *long* have you known these critical contacts?
2. On average, how *often* do you interact with these critical contacts?
3. On a scale of 1 to 5, how close is your relationship with these critical contacts, on average?

**Access to Tangible Resources**

In the following set of questions, **resources** refer to physical assets (e.g., capital, technology, equipment) that improve the efficiency and/or effectiveness with which your work group is able to complete its tasks.

1. Employees in this group feel comfortable contacting other [division] employees to request resources needed to complete group tasks.
2. It is easy for employees in this group to secure additional resources when they are needed to meet the group's objectives.
3. This group has access to sufficient resources to be successful.

**Access to External Knowledge**

1. Employees in this group often exchange work-related ideas and new developments with other [division] employees outside of the group.
2. Employees in this group can easily obtain necessary information from [division] employees outside the group to make good decisions about the group's work.
3. Employees in this group can easily find required information in other parts of [division] that they need to complete their work.
4. Employees in this group know where to find relevant information outside [division].
5. It is easy for this group to acquire knowledge that it does not already possess from outside of [division].
6. Employees in this group often obtain new information and ideas from people outside [division].

**Access to Group Knowledge**

1. Employees in this group often exchange information and ideas with each other.
2. Employees in this group often obtain necessary information from other employees in the group to complete work-related activities.
3. Employees in this group are willing to exchange and combine ideas with each other.

**Adaptability**

1. Employees in this group have difficulty changing gears in response to unpredictable or unexpected events and circumstances.
2. Employees in this group can effectively make decisions even when conditions are not black and white.
3. This group refuses to be paralyzed by uncertainty or ambiguity.
4. This group is able to adjust plans, goals, actions, or priorities to deal with changing situations effectively.
5. This group is able to modify its objectives in light of changing circumstances.
6. This group can quickly change its plans and courses of action when necessary.
7. Employees in this group are able to rapidly change course when their work requires it.
8. Employees in this group are efficient at making decisions.
9. This group has difficulty responding to changes in its environment in a timely manner.

**Innovativeness**

1. This group frequently tries out new ideas.
2. This group seeks out new ways to do things.
3. This group is creative in its methods of operation.
4. This group is often the first in the organization with new ideas and ways of doing things.

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